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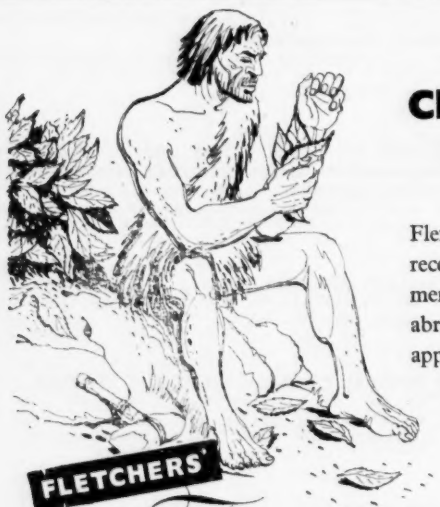

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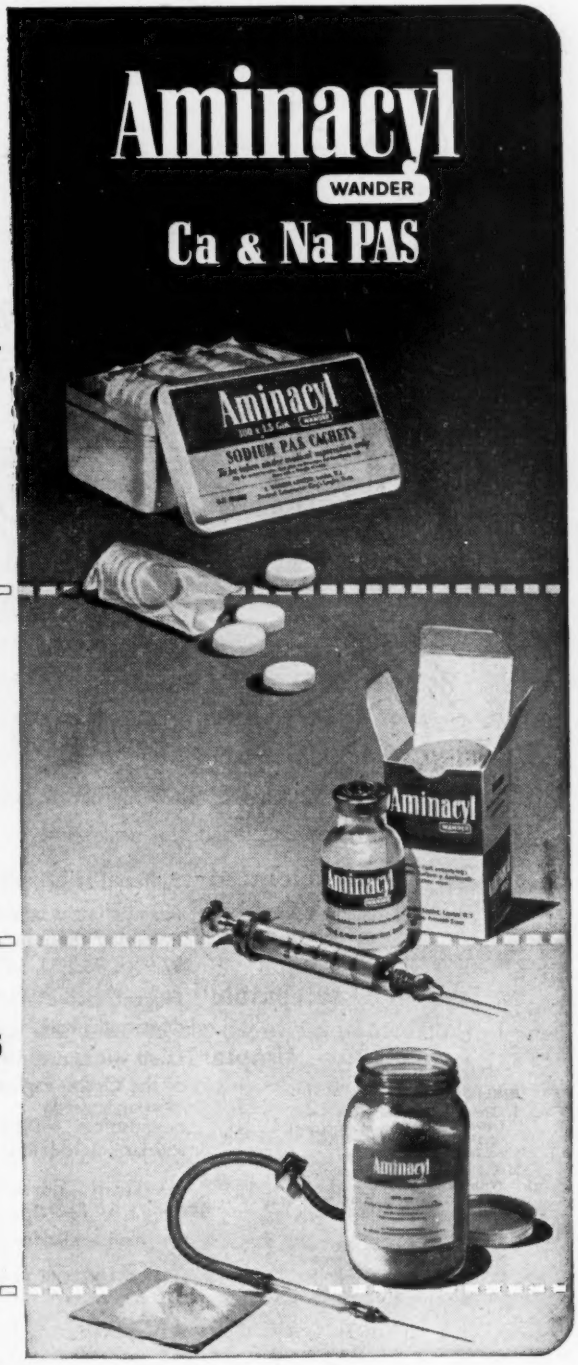

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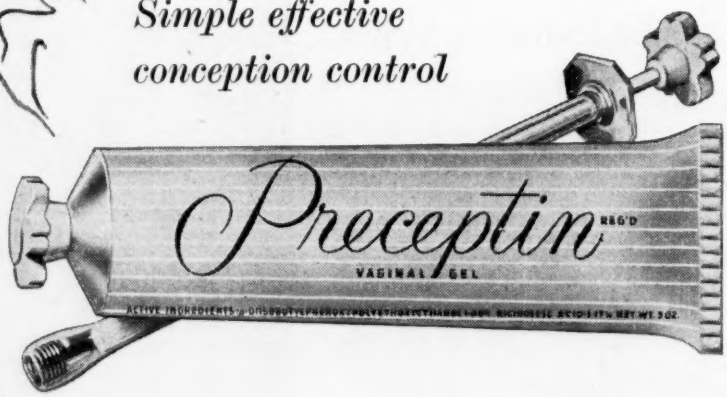

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1. Clinical Experience with a New Gel-Alone Method of Contraception. Ann. New York Acad. Sc. 54:831 (May) 1952.
2. A Method of Contraception Without Diaphragm—a Two-Year Investigation. Ann. New York Acad. Sc. 54:825 (May) 1952.
3. Talladega County Health Department, Alabama. Unpublished Data, March 1952.

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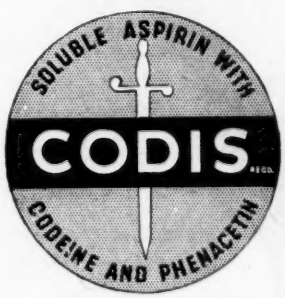

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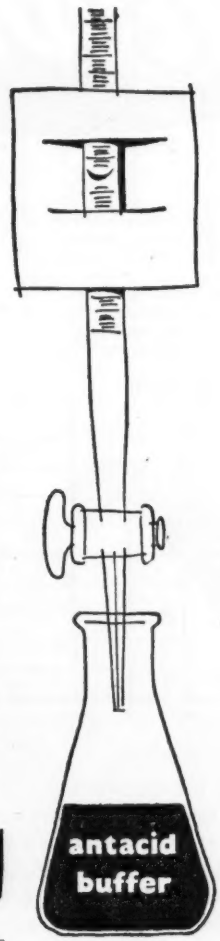

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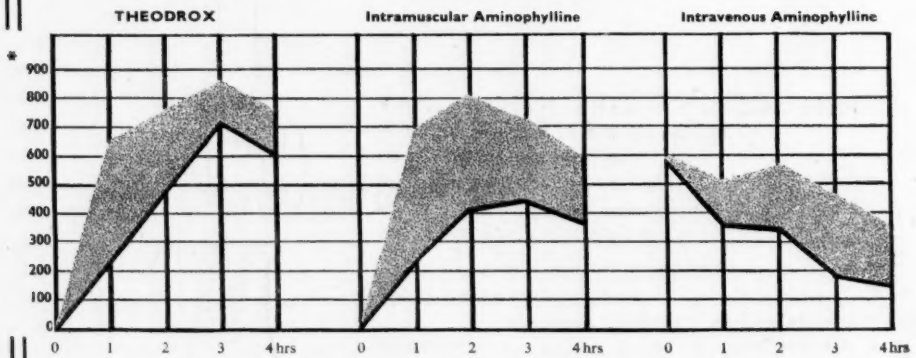

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REFERENCES

Administration of Aminophylline, *J. Amer. Med. Ass.*, 143 : 736, June, 1950. (This study does not refer to Theodrox.)

A New Approach to Increasing Tolerance to Oral Aminophylline. *Postgrad. Med.* 13 : 432, May, 1953. Abstracted ; *Practitioner* 171 : 328 (Sept. 1953)

Studies with Two New Theophylline Preparations, *Amer. J. med. Sci.*, 224 : 627, 1952.

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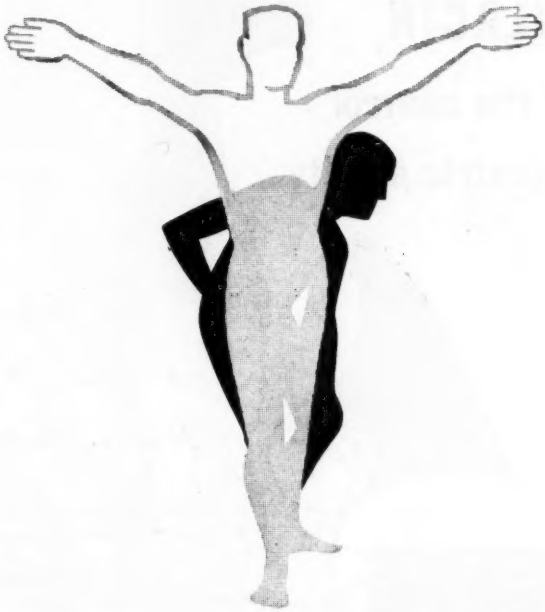

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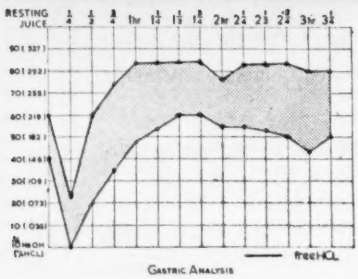
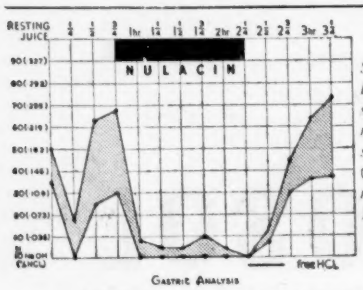


Superimposed gruel fractional test-meal curves of five cases of duodenal ulcer.



Same patients as in Fig. 1, two days later, showing the striking neutralizing effect of sucking Nulacin tablets (3 an hour). Note the return of acidity when Nulacin is discontinued.

REFERENCES: *British Medical Journal, 180-182, 26th July, 1952*

Medical Press, 195-199, 27th February, 1952

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OVERNUTRITION AND UNDERNUTRITION

I. CAUSES*

R. A. McCANCE
C.B.E., M.A., M.D., Ph.D. Camb., F.R.C.P., F.R.S.
PROFESSOR OF EXPERIMENTAL MEDICINE IN THE UNIVERSITY OF CAMBRIDGE

From the Medical Research Council Department of Experimental Medicine, Cambridge

LECTURERS nowadays seem to make themselves famous by confounding their audiences with accounts of their latest and most spectacular discoveries in subjects which are themselves only a year or two old. The profundity of their investigations is usually enhanced by the language in which they describe them, for they never refer to any substance by its proper name if this can be coded into a string of capital letters, sometimes followed by full stops. You will realise at once that I have abandoned all hope of achieving distinction in this way by having chosen as my title the time-worn theme of " overnutrition and undernutrition " ; and yet I feel justified in having done so, for the subject is just as important as nuclear physics or nucleoproteins. The world today is facing problems in nutrition which will not be solved by food alone (Russell 1949, Boyd-Orr 1950, Dodd 1952) ; and in spite of our clinics for obesity the threat of famine—the greatest famine the world has ever known—hangs over this country like the sword of Damocles (Fenelon 1952, Massingham and Hyams 1953).

Much has been written about undernutrition in the last ten years, and it is quite unnecessary, even if it were possible, to try to review the whole subject here. Keys, Brozek, et al. (1950) have produced a monumental work on the subject with nearly 3000 references. Lamy et al. (1946a–f), Hottinger et al. (1948), and Helweg-Larsen et al. (1952) have provided detailed information about famine as it was seen in the concentration camps, and Medical Research workers have given an account of milder undernutrition as it affected the population of a German industrial town (Medical Research Council 1951).

The unlimited amounts of food which have been available to most of the industrialised and prosperous communities have tempted many people in them to eat too much. This, coupled with the increasing importance of vascular diseases in their ageing populations, has forced both clinicians and investigators to pay attention to the subject of overnutrition. Work on obesity has been extensive for many years, some of it very exact (Newburgh and Johnston 1930, Møller 1931, Conn 1944, Newburgh 1944, Rynearson 1951), and new ways of exploring its effects on the composition of the body have been devised (Behnke 1942, Edwards 1950, McCance and Widdowson 1951). The results of these investigations have been published and are available.

I have, therefore, in these lectures tried to concentrate mainly on aspects of the subject which have perhaps not been fully appreciated. Clinicians, for instance, have always found it very difficult to accept the principles of thermodynamics, and have tried to escape from them again and again in order to explain the weaknesses of themselves and of their fellow men. There has been a tendency, moreover, to think of overnutrition and undernutrition as two quite separate pathological states, and too little attention has been directed towards finding out how and where they converge into that broad and ill-defined fairway of normal nutrition which lies between. Very little is known about the importance of keeping strictly in the centre of this fairway, and almost nothing about the possibilities of a planned departure from it. The burden of my song will be calories—and to some extent proteins. They are not so popular as the vitamins today but they are just as important : interest in them will return.

First Principles

Life as we know it consists in the metabolism and exchanges of protoplasm, and requires for its continuous existence a source of energy and a supply of nitrogenous material in some form or other to replace wastage. At some period of their lives all living cells have the capacity of increasing their protoplasmic mass. This constitutes growth, and demands the supply or synthesis of all the protoplasmic constituents of the cell. The bulk of these contain nitrogen. If at any time the supply of energy exceeds their immediate requirements, organisms have the capacity of storing it, usually in the form of carbohydrate or fat. If the provision of energy is insufficient, living creatures draw upon their store and lose weight.

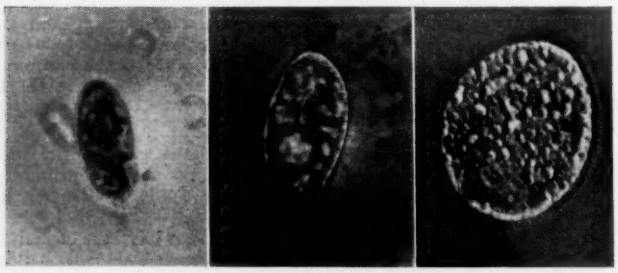
These basic principles are beautifully illustrated by unicellular organisms. These organisms have great capacity for growth, which itself creates enormous demands for energy. The best way to observe them storing fat is to study them at a time when growth is for some reason limited while at the same time the provision of energy is not. Growth may be restricted for this purpose by reducing the supply of nitrogenous material to the quantities necessary for the replacement of wastage. This can be done very simply in diatoms by placing them in sunlight in distilled water (von Denffer 1948–50). Nitrogenous katabolism can be neglected in such plants if photosynthesis is allowed to go on. Consequently they lose none of their cell mass and merely deposit storage material in the form of carbohydrate and fat. The same sequence of events takes place as a culture of green algæ uses up its growth-promoting materials (Spoehr and Milner 1949, Fogg 1953). Some green algæ produce chemicals which accumulate in the culture medium and inhibit cell-division (Pratt and Fong 1940, von Denffer 1948). In the presence of light this leads to the storage of large amounts of fat, and the whole process can be compared with adult life in more complicated organisms. Some *Chlorellas* which were grown for me by Dr. G. E. Fogg had an average cell volume of 80 c.μ when the colony was young and 120 c.μ after the cells in it had become old and fat. The dry matter of an old *Chlorella* culture may contain 70% (Aach 1952) or even 85% of fat (Spoehr and Milner 1949).

If protozoa are removed from their normal environment and placed in a salt solution or distilled water they continue to swim about actively but they cannot grow. They lose some of their protoplasmic mass by irreversible degradation and they dissipate much of their stores of fat. In consequence they lose weight and get very thin. Exactly the same process goes on in green algæ if they are kept in the dark. *Tetrahymena pyriformis* can be grown successfully on a synthetic medium containing a mixture of amino-acids (34%) and glucose (66%). Dr. L. D. Hamilton and I have been studying the effect of keeping these organisms in a mixture of glucose and buttermilk which contains 16% protein, 81% carbohydrate, and 3% fat. This diet provides a little fat and more carbohydrate than the other but much less protein. Consequently it has the effect of limiting the growth-rate of the organisms relative to their capacity to synthesise fat, and the result is that they get very obese (fig. 1).

Adjustment of Intake and Expenditure

The drive to eat and the desire to drink are essential instincts for survival. But how are the impulses controlled ? Many writers on this subject have used the words hunger, thirst, appetite, and satiety ; but, even if

* The first Humphry Davy Rolleston lecture for 1953, delivered before the Royal College of Physicians on May 5. The second lecture will be published in a forthcoming issue.



a b c

Fig. 1—Effect of overnutrition and undernutrition on the protozoon *Tetrahymena pyriformis*: *a*, after being grown on a good medium (see text) and then starved; *b*, a normal individual grown on a good diet; *c*, an obese individual grown on a buttermilk-glucose medium (× 1200).

closely defined (Bruch 1940), these words have such strong and such different subjective meanings that it is impossible to use them objectively. A rat knows nothing about the differences between hunger and appetite, and all the work on this animal (Adolph 1947) shows that the word satiety, as we interpret it, has no place in its *modus vivendi*—yet something keeps the normal rat in water balance and calorie equilibrium. People usually drink more water than they need; but there is little if any possibility of drinking too much, because all animals are provided with a mechanism for correcting this, and, no matter how great the indiscretion, the kidney can be relied upon to restore and maintain within narrow limits the volume and composition of the fluids in the fat-free parts of the body. The amount of water in the body, therefore, is regulated as a rule by the control of output. The desire to drink, however, may not be strong enough in hot climates to keep people fully hydrated (McCance and Young 1944, Adolph et al. 1947) and its complete suppression is much more rapidly fatal than a total abstinence from food. No-one appreciated until too late that the famous Welsh Fasting Girl would die of dehydration, but she did so long before anyone was expecting to see her succumb to a lack of food (Fowler 1871). Dehydration has been the cause of far more deaths than starvation among shipwrecked personnel and may have been responsible for some of the failures to reach the top of Mount Everest.

Before discussing how the calorie balance is adjusted, it is well to say a word or two about how accurately this is usually done. The food of the "average" man has often been found to provide about 3000 calories a day; but the figure varies very much from one individual to another, and in any group of 20 or more men or women, or boys or girls of the same age, there is likely to be one who appears to be eating a diet which provides him or her with twice as many calories as another (Widdowson 1947). Since both may well be maintaining their body-weights at a steady level, and since variations in digestibility and absorption may for practical purposes be neglected, it follows that the energy expenditure of different individuals must also vary. How does a person know just how much food to eat to meet his own personal calorie requirements? If the "average" man takes 9 calories per day more than he requires he will only be 0·3% "out" in his adjustments. Few chemical assays in the biological field have an accuracy approaching this (Wootton and King 1953), and this error would mean a gain in weight of only 1 gramme of fat a day—about 0·000014% of the weight of the body. This does not sound very important, but in matters of this kind "the little more and how much it is," or (in language less poetic than that of Robert Browning) this error, if cumulative, would amount to 15 lb. in twenty years. This gain in body fat is possible only because the surplus fat is continually being removed from active participation in the processes of the body and stored in a relatively unreactive state. Such an accumulation could not be tolerated with an active electrolyte like sodium. As a matter of fact this is the sort of error that most people make as they approach middle age, for the "normal" or "average" weight for a given height is about 15 lb. more in the forties than it is in the twenties (Metropolitan Life Insurance Tables, Stern 1949) and this added weight is largely due to fat (Brozek 1952).

Expenditure of Energy

In collaboration with Dr. O. G. Edholm, Dr. E. M. Widdowson and I have recently been studying the food intakes and energy expenditures of a group of active young men in training for the Armed Forces. Methods have been developed recently by which the energy expenditure on tasks involving considerable muscular movement and exertion can be obtained relatively easily, and we may expect more information on this aspect of practical physiology before long. We were not able to apply these newer methods, but Dr. Edholm pursued the friendly and coöperative young men with pencils and paper, and even from time to time with Douglas bags. He could not, of course, keep them all under his eye for the whole of the week, but he made them write down everything they did during each half-hour of it. Two brains may be better than one for some purposes. We cannot pretend, however, that the Edholm-Widdowson combination balanced out these peoples' calories as well as each man was capable of doing it for himself, for Dr. Widdowson found that the young men's food provided each of them with an average of 3705 calories a day, while Dr. Edholm, working quite independently, calculated that their energy expenditure amounted to 3427 calories. The two investigators were, therefore, nearly 300 calories out on their "balance." Dr. Edholm's results do, however, give us a very good idea how the calories were being used. The table shows the figures he adopted for some of the tasks these men carried out, and the times they spent on them, and fig. 2 shows how the 3427 calories were distributed among the different occupations. A comparison of the two is very instructive. Sleeping, and sitting down at lectures and similar jobs, did not require many calories per hour; but even these lions spent a lot of time over them and they accounted for 1715 calories per day—nearly half of the total. Walking and cycling about between the lectures and in pursuit of their daily tasks used up more of their energy than anything else they did except sleeping and sitting. These are two rhythmical activities which can be sustained for hours on end and if indulged in to any extent soon use up a large number of calories. Squash is a very energetic pursuit but the time spent upon it is necessarily limited, and

ENERGY DEMANDS OF CERTAIN OCCUPATIONS AND THE AVERAGE TIME SPENT UPON SOME OF THEM

Occupation	Cal./70 kg./hr.	Hr./day	Occupation	Cal./70 kg./hr.
Sleeping ..	69	8½	Standing	139
Sitting ..	112	9¼	Darts	146
Dressing, changing, cleaning personal equipment, &c.	200	2	Snooker	156
			Cricket	156
			Running	520
			Squash	520
Walking ..	418	1		
Cycling ..	500			
Sports (as a whole)	..	¾		

games as a whole only accounted for 256 out of the 3427 calories. Notice, furthermore, that more of their energy went on dressing, changing, and cleaning their personal equipment than on their practical training.

The expenditure of energy is largely dictated by circumstances and opportunity. Some men have to run for twenty minutes every morning to catch their train: others get to work in three-quarters of an hour on a cycle; while others again move mostly by car and elevator. The energy men and women are called upon to expend, moreover, may vary widely and without warning from day to day. Edholm found that the cadets varied their calorie expenditure during the week of observation over a range which averaged 775 calories per day. Stability of weight is often maintained over periods of years by an adjustment which is very exact, but it is perfectly certain that the adjustment may be widely out over short periods of time. Most people overeat, for example, on Christmas day, and some of them upset their calorie equilibrium still further on that day by taking less exercise than usual. Many take violent or prolonged exercise over the weekend and few know enough about food values even to attempt to equate their weekend calories to it. Animals never could. Yet a child of 8 months, instinctively and without direction, will take just the right amount of food for its maintenance and growth (Davis 1928, 1939), and a mouse or a rat will increase its food intake to many times its usual level during a full lactation and drop it again immediately afterwards to maintain an almost constant body-weight (Kennedy 1952). Observation, particularly of animals which cannot be expected to exercise any conscious control of their intakes, indicates that the expenditure of energy is directed by opportunity, external compulsion, and physiological requirements. The intake of energy is adjusted to meet these demands. Calories are the only requirements to be met constantly like this, although that of water may be at times, and, if the contents of the gut be regarded as lying outside the substance of the body proper, then the requirements of iron can be considered as being met in a similar way (McCance and Widdowson 1937, 1943, Hahn et al. 1943). The mechanisms by which the intake of calories is controlled must now be considered.

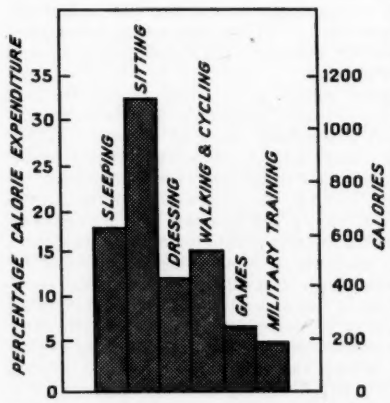


Fig. 2—Actual and percentage of total calories expended on various activities.

The Drive to Eat

In a really primitive state it was probably impossible to eat too much, certainly to do so for months on end. Food was too hard to come by, and the time and opportunity to eat it were lacking. Enormous meals must have been taken from time to time, but the fat man would soon have lost the race when survival went to the swift. A voracious desire to eat, however, was probably an asset in the struggle. Cooking must have been primitive when there was any cooking, and food, even if plentiful, was probably not very easy to eat. One can only eat too much if one can get too much. Obesity, in other words, results from leisure and plenty. It is one of the troubles of civilisation, but all civilised people are not troubled by it. A man gets too fat only when the natural control of his food intake has failed.

A desire to eat is often associated with contractions of the stomach, and at one time these were thought to be the cause (Cannon and Washburn 1912, Carlson 1913, Hollander 1946). These contractions can be felt by a man and make him want to eat; but dogs with their vagi cut still attack their food (Grossman and Stein 1948), and there are certainly other incentives. The nose, the eyes, the ears, and memory with everything it represents in cortical integration, are all involved.

When insulin had been discovered and its effects began to be explored it was soon found that one of the results of a low blood-sugar was a desire for food. Insulin has, in fact, been used extensively as a drug to stimulate this, but its clinical effects have been attributed by some people merely to suggestion (Freyburg 1935). Mayer and his associates (Mayer 1952, Mayer and Bates 1951, 1952, Mayer et al. 1952) have taken up the subject again and carried out more experimental work. They believe that there is a glucostatic mechanism for regulating the intake of food. Their idea is that the drive to eat, in all its manifestations, is caused by a fall in the level of circulating blood-sugar, or, more precisely, by a change in some high-energy-bond equilibrium within some sensitive cells which depends upon this level. They have shown experimentally that injecting glucose or adrenaline decreases an animal's food intake, whereas insulin puts it up, and sucrose and fat emulsions are without effect. Similar experiments have been carried out by others (Hanson and Grossman 1948, Janowitz et al. 1949, Janowitz and Grossman 1949), not always with the same results. Mayer has also used hypophysectomised alloxan-treated animals as test objects and studied the relationship in man between arteriovenous glucose differences and the sensation of hunger, which is felt only if the difference is small. The ravenous urge to eat in a simple untreated diabetic he attributes to the failure of the sensitive cells to metabolise the glucose circulating in the plasma. It may be added that low blood-sugars have been found in human undernutrition, and death has even been attributed to the fall (McCance 1951).

Most will agree that a case has been made out for regarding a fall in blood-sugar as *one* of the things that make people want to eat, but there must be more. Absence from food makes for generalised nervous activity of which contractions of the stomach may be one manifestation, a keener sense of smell (Goetzl et al. 1951–52) and irritability others. It is possible that a fall in some essential material within the nerve-cells or their end-organs, rather than in the medium outside them, may be the cause of the nervous activity, restlessness, and reflexes which initiate the desire for food.

The "Stop" Mechanism

Protozoa may be prepared to eat for twenty-four hours a day, and it may be impossible to satisfy their appetites if the food supplies everything that they require for growth. Not so the simple hydra, however, which ceases to feed or to make any response to food when it has been very well filled (Buchsbaum 1953). Most animals, and certainly man, do not eat continuously even if they get the chance. They stop, I suggest, because food is one of the oldest and greatest sedatives. It acts thus even in animals like hydra which possess only the most primitive nervous systems, and it does so by abolishing that activity and restlessness which had initiated the drive to eat. There is a little experimental evidence that this is true, at any rate in man; for Goetzl et al. (1951–52) have found that the sense of smell becomes less keen after a meal, even after one with no smell like sucrose. If the effect of food is to replenish nerve-cells with oxidisable, osmotic, or structural materials, it is possible to explain

not only the effects of a single meal but also the sustained voracity of the really undernourished (Widdowson 1951), for it may take a long time to rebuild the essential structures within the nerve-cells. One may recall for something comparable the length of time it takes to restore the serum-cholinesterase to normal levels in people who have been undernourished (Hutchinson et al. 1951). At present these ideas are but idle thoughts, for they have yet to be explored by experiment; but they may turn out to have been of some scientific value when these very fundamental problems have been solved.

Little as we know about the mechanisms which restrain the primitive urge to eat, we do know a number of times and ways in which the adjustment between calorie intake and expenditure may break down. A study of them tells us something about the controlling mechanisms in the higher animals and also shows us where more knowledge would be very helpful.

Breakdowns in Mechanisms Normally Adjusting Intake to Expenditure of Calories

SCARCITY

Under the heading of scarcity must be classed all the degrees of undernutrition which result from economic stress, war, famine, and the like. These are purely physical causes, and so obvious that they need only be mentioned for the sake of completeness. The same applies to the undernutrition which follows in the wake of physical diseases like cancer, particularly of the œsophagus or stomach, and other gastro-intestinal abnormalities. In all of these, intake fails to keep pace with requirements.

PHYSIOLOGICAL REASONS

Periods of physiological overnutrition and undernutrition are part of the life-cycle of some animals. The young Atlantic seal, for instance, becomes extremely fat during the first few weeks of its life when it is being suckled by its mother. The parent thereupon leaves her offspring to its fate on the beach and takes to the sea again, and the young seal lives on its own fat for the next few weeks before it attempts to follow its mother to the open sea and to hunt for its own food. Some sea birds go through similar stages in their development, and a marmot (Morgulis 1923) may get fat enough during the summer to lose up to 40% of its weight during hibernation. There seems to be a tendency for most animals to eat more than their immediate requirements if the food-supply gives them the chance. Perhaps the most dramatic example of physiological undernutrition is provided by the migrations of the spawning salmon; but these must be considered as bordering on the pathological, for the Pacific salmon all die after spawning. Guineapigs, unlike most other animals except man, are quite fat at birth, and weaning begins at once. It would perhaps be better for the young guineapigs if they were not so precocious; for most of them, in consequence, go through a fortnight or more of physiological undernutrition. Most of these physiological departures from normal nutrition are entirely instinctive. The higher centres are not involved. Given the right conditions the results are as inevitable as they are in the protozoa.

PSYCHOLOGICAL REASONS

Many people who are worried by the cares and troubles of this life find relief in eating and in the mental rest which follows it (Babcock 1948). "Fate cannot touch me, I have dined today" is the basis of a great deal of obesity. Food must be compared to alcohol in this respect, and the victim may be anyone from a harassed and successful company director to a miserable and flagrantly psychopathic woman. We have recently had the opportunity of studying a boy of 14 who now weighs 16½ stone (104 kg.) mainly because of the psychological support he derives from overeating. While he was in hospital he was given a free run of the kitchen services for a week and his food was found to be providing him with 3455 calories per day. Up till now all attempts to do anything for him have been frustrated by his own mentality and by his foolish and indulgent mother.

A woman may lose all control of her food intake during pregnancy, immediately after delivery, or during lactation. She may eat ravenously and become immensely fat in a very short time. These interesting cases have been investigated by Sheldon (1949) under the general title of maternal obesity.

The very things which drive some people to food prevent others from taking enough of it. Worries and troubles are such a common cause of a loss of weight that there is no need to elaborate on them further. During a continuous fast which has been undertaken for bravado, religion, or gold, the desire for food is said to pass off after a few days; but the men and women who do this kind of thing are not psychologically normal, and this is only one example of hunger being abolished by emotion (Morgulis 1923). Sexual activity provides most striking inhibitions in the animal world and may operate quite forcibly in man. Except in psychotics and in young women with anorexia nervosa, hunger generally begins to assert itself before the undernutrition has become serious. It is easier to get too fat than too thin.

Psychological breakdown of control clearly involves the highest nervous centres, and in man it is obvious that the cortex is an important link in the chain of control. Some patients who have had one of their frontal lobes removed on account of a new growth get very fat (Rylander 1939) and so also do some who have had leucotomies (Partridge 1950).

It is difficult to classify all the causes of psychological breakdown. A man often puts on weight for a time after getting married, or after giving up smoking. A sudden change of diet from one which is bulky and of low calorie value to one which is just the reverse may so deceive the body and the psyche that a gain in weight is the immediate result. This was well illustrated by the behaviour of the subjects in our Experimental Study of Rationing (McCance and Widdowson 1946). The experimental diet on which the party had been living for the previous three months had been a bulky one and had contained very little fat. At the close of the experiment four persons who had become accustomed to this food found themselves free to eat what they chose. They continued to eat up to the anatomical capacity of their stomachs, but they replaced some of their cereals and vegetables with foods like fat and sugar, of high calorific value but of negligible bulk. The result was that, when the end of the first week of freedom came, two of the subjects were found to have been eating food providing them with about 1500 calories a day more than their accustomed amount—and the result was an inevitable gain in weight. People who have lost control for these reasons usually regain it again, sometimes quite soon. They may merely cease to gain weight, and stabilise out at a new level, or they may revert to their original weight over the next year or so.

A CHANGE IN REQUIREMENTS

If adult rats are confined in very narrow cages (Ingle 1949) they become obese. This has its counterpart in human experience, for a person often gains weight if he buys a car and ceases to take his usual exercise, or if he is confined to bed with some trouble which does not interfere with his appetite or metabolism. The converse is less common, but I know a man who regularly lost many pounds of fat on his annual mountaineering holiday and relied upon it to keep his corporation within reasonable limits.

In these instances one must suppose that the change in requirements failed to register on the control mecha-

nism, probably because within the time of observation the stimulus was not strong enough to break through a pattern of behaviour previously acquired. We may compare the way in which quite severe dehydration may at times be tolerated by the centres controlling the intake of water, even though it leads to a loss of bodily efficiency.

AGE

Advancing age is probably the commonest cause of the intake failing to conform to requirements. Its effects are obvious in both man and animals and numerous reasons probably contribute to them, a reduction of activity being one. The balance nearly always swings towards obesity at first and a pleasure in food may be retained until very old age; but old age and all that it involves sometimes makes a man apathetic and inclined to give up the struggle to provide himself with all the food he needs, but for which the zest has gone (Hobson and Blackburn 1953).

EXPERIMENTAL BREAKDOWN

Gold Salts

Apart from immobilising an animal and overfeeding it, or removing its testes or ovaries which may produce its effects by reducing activity, obesity has now been produced experimentally in a number of ways which all offer scope for further study and development. Brecher and Waxler (1949), for instance, found that if mice were given a single large dose of aurothioglucose, about half the animals lost control of their calorie intake, doubled their weight or more, and became very fat. No lesions were found in the brain, hypophysis, or thyroid, or indeed in any of the other organs likely to have been responsible. Further work will no doubt discover the connection.

Heredity

Danforth (1927) produced a strain of mice with a pronounced tendency to develop obesity. The trait is associated with a yellow colour.

Danforth showed that these mice were usually rather smaller than their littermates at birth and were two or three times as heavy eighteen months later. They ate far more food. Mayer et al. (1951) found that the obese mice tended to select a diet which contained much fat whereas their littermates chose one which was mainly carbohydrate. Guggenheim and Mayer (1952) believe that these animals have an abnormally low capacity for the oxidation of acetate. This leads to an increased utilisation of acetate for the synthesis of fat. Their evidence, which is based upon the use of radioactive carbon compounds, is not altogether convincing. Whether or not there is a perversion of acetate metabolism towards the synthesis of fat, Danforth (1927) showed that the fat in these animals could be mobilised and oxidised quite normally if the animals were not given enough food. Further work on this syndrome may help us to understand some of the cases with which we are all too familiar in the outpatient departments.

Hypothalmic Lesions

A third way of disorganising the control of food intake has been by the puncture and destruction of two small loci on each side of the hypothalamus. As with some other great advances in physiology, the lead came from the clinicians (Mohr 1840, Paget 1891, 1897, Fröhlich 1901, Duncan 1924, Evans 1937) who described the association of obesity with lesions of this part of the brain. Destruction of the two lateral nuclei has been found to give rise to complete anorexia, and obesity has been produced successfully in dogs, cats, monkeys (Ranson et al. 1938), and rats (Brobeck 1946, Brobeck et al. 1942–43a) by puncture of the two medial nuclei.

Immediately after the latter operation the animals exhibit the most voracious impulse to eat. They gain weight with great rapidity for a time and the increase over the control animals is due almost entirely to fat. At this stage they continue to provide themselves with far more calories than they require, even if the food is made unpalatable by mixing it with kaolin or by giving the animals a limited amount of water. Mayer (1952) has found them to have very low blood-sugars.

After a time they gradually re-establish control of their calorie equilibrium and cease to gain weight. At this stage they are found to be eating no more or very little more than the controls. When they have regained calorie equilibrium after getting very fat they become distinctly "choosey" about their food. Making it more palatable leads to a further gain in weight, and making it very unpalatable may cause an extensive loss of weight. At any time after operation a reduction of weight brought about by compulsory starvation or an unpalatable diet is rapidly made good as soon as the original food is restored.

If normal rats are starved or undernourished for a time, they rapidly make good any weight they may have lost when they get the chance; but they react quite differently to alterations in the palatability of their food, for they tend to maintain a constant weight by linking their calorie intake very closely to their calorie expenditure. When normal rats, however, get very old and fat they tend to behave rather like the operated animals that have got fat (Brobeck et al. 1942–43a, Bruce and Kennedy 1951, Kennedy 1950, 1951, 1952).

The enormous intake of food of these animals after operation puts a severe strain upon their carbohydrate metabolism, but they do not usually excrete glucose (Brobeck et al. 1942–43b). The stored fat can be mobilised freely if the calorie intake is reduced, and there is nothing to indicate that there is anything abnormal about their fat metabolism. The gain in weight and its consequences are wholly the result of eating too much food. The lesions may also lead sometimes to side-effects, particularly in water metabolism (Stevenson 1949, Bruce and Kennedy 1951).

Clinicians will recognise many points of resemblance between the behaviour and pathology of these animals and of the patients who attend their obesity clinics. The ravenous food consumption for a time after pregnancy; the re-establishment of control on quite a moderate intake of food but at a much greater weight, the tendency to return to this weight after it has been reduced; and the fat old gourmet always looking for more palatable food and gaining weight on it may all be recognised.

Cortisone

Many people treated with cortisone lose control of the balance between calorie intake and requirement (Sprague et al. 1950). Hench et al. (1950) reported that 11 out of 21 of their patients developed "tremendous or insatiable" appetites and one of them was found to be taking in 6000 calories per day. Hench et al. (1950) pointed out that no prediction could be made as to which patients would react in this way and that the magnitude of their response bore no relation to the benefits of the treatment on their joints. The patients all gained weight, sometimes a great deal of weight, and this was in the main due to a gain in fat and muscle. The retention of water and salt which might also be brought about by cortisone was a complication, but only a minor one.

No-one at present can say how cortisone makes people react in this way, but there are two possibilities. Firstly, cortisone produces in some people a sense of well-being and euphoria which might break down the usual critical control exercised by the cortex and make these people overeat like those who have had a leucotomy. Secondly, cortisone decreases carbohydrate tolerance, increases the resistance to insulin and may lead to frank diabetes. With the doses used by Hench et al. (1950) these effects were small and were considered to be functionally unimportant, but if Mayer (1952) and his co-workers are right in suggesting that the control of food intake normally depends upon the level of circulating glucose available—i.e., utilisable in some sensitive cells in the body—then this may be the explanation. Only further work, preferably quantitative work, will decide.

Natural Experiments

Tumours and other abnormalities of the ductless glands may break down the normal adjustment of food intake to food requirement. Thyrotoxicosis always increases the demand for calories. This is usually not met by an equivalent rise in intake; why not, we do not know, and a loss of weight is the result. Some patients with thyrotoxicosis, however, do not lose weight and may even get fat. In them, presumably, the mechanism of control remains intact and the drive to eat may even be so highly stimulated by the demand for calories that it makes the patients over-react. Simpson (1952) has put forward the case for the adrenals and islet tissue. Ductless glands must act through their hormones—thyroxine, insulin, cortisone and so on—and the way in which these hormones act has been discussed. Hormones may modify the proportions of protein, fat, and carbohydrate normally broken down, and the adrenal hormones may alter the sites in the body upon which fat is deposited; but these hormones can only induce generalised over-nutrition or undernutrition by upsetting the mechanisms which normally adjust intakes to requirements. They might be used more extensively to further our knowledge of these mechanisms.

The Network of Control

From this jumble of observations and experimental facts it would appear that many things must be involved in the control of calorie equilibrium. A few of the known ones may be:

(1) A humoral mechanism depending upon the level of glucose and other metabolites in the plasma. These may supply the nerve-cells with materials which produce widespread changes in activity and behaviour.

(2) Fully coördinated nervous "centres" at some level in or below the hypothalamus. These are normally "set" by humoral or nervous influences to produce uncontrollable hyperphagia. They may conceivably be the two lateral nuclei in the hypothalamus.

(3) Two medial foci in the hypothalamus which restrain the activity of the centres lateral to them or below them. These foci are presumably integrated with the cortex, the sense-organs, and other centres, and may also be actuated by a humoral mechanism. They are essential for the physiological control of calorie equilibrium, but, judging by the behaviour of animals after their destruction, control can be re-established in their absence, admittedly only at a level of nutrition which must be regarded as pathological.

(4) The cortex. In man this is involved at both conscious and unconscious levels. Both are extremely important, and the organs of taste, smell, sight, and hearing are naturally implicated as well—as are all the impulses arising from contractions or distention of the stomach.

From the practical point of view control is ultimately conscious in most healthy people; and, if they have the knowledge and the strength of mind—and of course the means to obtain all the food they require—their weight is a matter for themselves to decide.

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TREATMENT OF TUBERCULOUS MENINGITIS WITH ISONIAZID

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THE treatment of tuberculous meningitis with streptomycin has two main disadvantages: the need for continued intrathecal injections and the occasional toxicity of the antibiotic. So far as the injections are concerned, one must consider not only the long period of stress to the patient but also the possible effect of continued interference with the cerebrospinal fluid (C.S.F.) by repeated lumbar puncture introducing a foreign substance. Although it is dangerous to compare an acute disease with a chronic one, it is perhaps worth recalling that in meningococcal meningitis intrathecal medication—e.g., a combination of serum and sulphonamide—seemed to produce less satisfactory results than did oral sulphonamide alone (Department of Health for Scotland 1944). Some workers have indeed argued that the avoidance of lumbar puncture and the use of massive doses of parenteral penicillin are of benefit despite the poor passage of penicillin into the C.S.F. (Dowling et al. 1949). The discovery of the activity of isoniazid against *Mycobacterium tuberculosis*, and the finding that it passed into the C.S.F. in effective amount, suggested its therapeutic use in tuberculous meningitis. We describe here its effects as the main method of treatment in seven cases.

Material and Methods

The seven patients were unselected consecutive admissions to one unit which can exercise no control over its admissions but must accept all notified cases.

TABLE I—CLINICAL DETAILS OF THE TREATED CASES

Case no.	Sex	Age (yr.)	Clinical assessment on admission*	Isolation of *M. tuberculosis*	Mantoux	Family history	Other evidence of tuberculosis
1	M	1¼	Intermediate	C.S.F. +	+	Mother, sputum +	"Snowstorm" radiograph
2	F	3	Advanced	C.S.F. +	+	Mother, sputum +	Nil
3	F	16	Advanced	C.S.F. +	+	None known	Nil
4	F	20	Intermediate	C.S.F. +	+	None known	Pleural effusion
5	F	26	Advanced	C.S.F. +	+	None known	Nil
6	M	3	Intermediate	Organism not isolated	+	None known	Nil
7	M	3	Intermediate	Organism not isolated	+	None	Nil

*Classified according to Medical Research Council (1948).

The first patient was admitted in July, 1952, and the last in February, 1953. Every endeavour was made to confirm the existence of a tuberculous meningitis immediately after admission.

The first four patients received a similar schedule of treatment. During the first week in hospital streptomycin and isoniazid were both given. Streptomycin was given intramuscularly and intrathecally in a dose suitable to the patient's age and weight. After the first week treatment with streptomycin was stopped, and thereafter the sole chemotherapeutic used was oral isoniazid 10 mg. per kg. of body-weight daily for sixteen weeks.

The fifth patient had been treated for tuberculous meningitis with streptomycin in the unit previously and

TABLE II—DURATION OF ABNORMALITY OF CERTAIN CRITERIA

Characteristic	Mean duration (weeks) till characteristic regained normal					
	Cases 1–4		Case 5		Cases 6 and 7	
	Isoniazid-treated	Matched controls	Isoniazid-treated	Previous streptomycin treatment	Isoniazid-treated	Matched controls
Fever	4	9	6	40	8	8
C.S.F. cells	23	34	17	54	21	42
C.S.F. protein	15	37	Never normal	Never normal	14	33
C.S.F. sugar	13	25	10	52	8	31
C.S.F. chlorides	14	25	11	28	7	18

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was readmitted in relapse. She was now given isoniazid alone 10 mg. per kg. of body-weight by mouth daily.

The last two patients received a course of treatment similar to that of the first four, except that the duration of streptomycin therapy was increased to four weeks.

In all the cases a weekly lumbar puncture was done, even after streptomycin therapy had ceased. It should be emphasised that the schedule of chemotherapy was decided at the onset of treatment and was not affected by the condition of the patient.

To provide controls treated with routine streptomycin therapy, patients were selected from those treated in the unit during the immediately preceding period. An attempt was made to "match" the isoniazid-treated patient with a control of similar age and severity of illness on admission. Since all the treated patients have so far survived, the controls were selected from surviving streptomycin-treated patients. The fifth patient served as her own control.

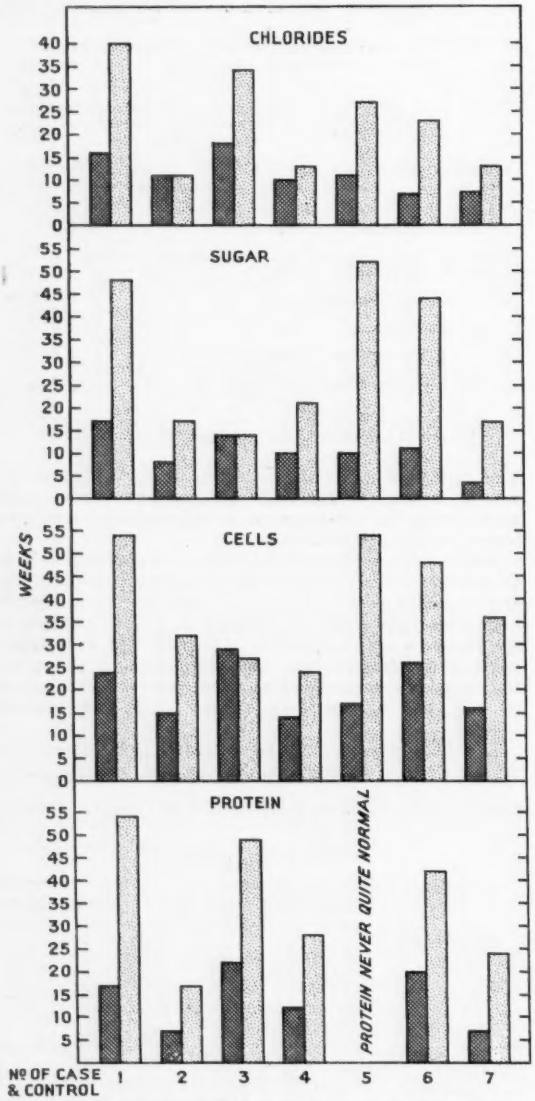

Fig. 1—Alterations in amounts of certain constituents of C.S.F. during treatment: hatched, isoniazid-treated patients; stippled, streptomycin-treated controls.

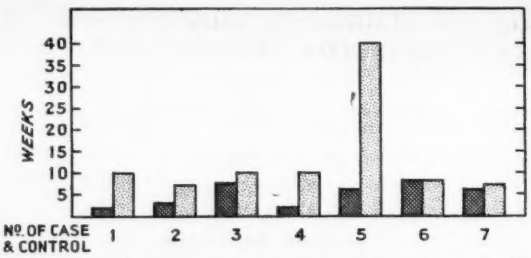

Fig. 2—Time taken for temperature to settle: hatched, isoniazid-treated patients; stippled, streptomycin-treated controls.

Results

Table I gives brief clinical details of the seven patients.

As already stated, all the patients have survived, but the longest period of survival is only twelve months. At the present stage we have decided to use as factors of assessment the results of the serial examination of the C.S.F. and the duration of the initial fever. The following were adopted as "normal" findings for the C.S.F.: (1) cells <10 per c.mm.; (2) protein <40 mg. per 100 ml.; (3) sugar >45 mg. per 100 ml.; and (4) chlorides >729 mg. per 100 ml. For each patient in the series and for each "matched" control the time which elapsed until these normal findings were reached was calculated. These data are shown in figs. 1 and 2; the mean figures are given in table II.

Fever

The difference is greatest in the group of patients who received a minimal course of streptomycin. In those patients who were given streptomycin for four weeks the initial fever lasted much longer. Although the point requires further study, it seems possible that either the intrathecal irritation produced by the streptomycin or the stress of repeated lumbar puncture may be responsible for prolonging the fever.

Constituents of C.S.F.

As regards all the factors chosen for comparison, the isoniazid-treated patients returned more rapidly to normal. So far as the cells and the protein are concerned, such an effect may not be surprising, since any irritant effect of streptomycin, with the production of an "aseptic meningitis," was reduced to a minimum, especially in cases 1–4. The more rapid return to normal of the sugar and chloride content is perhaps more interesting. In view of the modern opinion that the chloride content is merely a reflection of the serum-chloride level, the question of whether the streptomycin-treated patients had had persistent vomiting was considered. The records did not suggest that this had been a major manifestation.

Although what might be termed the general progress of the patients cannot be defined in figures, all those who observed the patients said that the appearance of clinical recovery in those given isoniazid was very rapid. The appetite improved, there was obvious gain in weight, and even the young patients were happy and contented at a stage in the treatment much earlier than was our previous experience with orthodox streptomycin therapy.

Discussion

We are aware that the follow-up should be longer, and that our method of control is not above reproach. It seems, however, that isoniazid alone has proved effective in some cases of tuberculous meningitis. Further, it seems that the lessened interference with the meninges and C.S.F. which is possible with oral therapy may have advantages in securing a more rapid return to normal of the C.S.F. chemistry. There is no doubt that the less arduous treatment has been advantageous in securing a much happier patient and a ward whose morale is not

disturbed by the constant repetition of intramuscular and intrathecal injections.

We do not suggest that isoniazid alone should be regarded as adequate therapy for patients with tuberculous meningitis. The rapidity with which *M. tuberculosis* may develop resistance to isoniazid administered alone (Medical Research Council 1953) indicates a need for caution, and was our reason for prolonging the course of streptomycin in cases 6 and 7. Our series was so small that it does not permit any comment on this point. Nevertheless these encouraging results support the view that both the total amount of streptomycin and the duration of its administration might be reduced, with benefit to the patient's comfort and an increase in the rapidity of his recovery.

Summary

Seven patients with tuberculous meningitis were given isoniazid by mouth as the main method of treatment. All are alive after a follow-up period ranging from six to twelve months.

The return to normal of the C.S.F. constituents was more rapid than in cases treated in the conventional way with streptomycin.

There is a need to examine the best method of utilising these chemotherapeutic agents in tuberculous meningitis, with the aim of reducing the amount of intrathecal interference.

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TREATMENT OF TUBERCULOUS MENINGITIS WITH STREPTOMYCIN AND ISONIAZID

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SINCE the introduction a year ago of a new treatment for tuberculous meningitis in this hospital, a considerable change has taken place in the clinical evolution of the disease and in its prognosis, with a striking reduction in the tragic sequelæ that had so often followed in the past.

The arrival of streptomycin had already done much to control this disease, but treatment with streptomycin alone was long, tedious, uncertain, and difficult, and there could be no hope that this drug alone would solve the problem. In our experience the combination of streptomycin and *p*-aminosalicylic acid (P.A.S.) may lead to permanent cures, but the prospects become much better with the introduction of isoniazid.

A Combined Treatment

In May, 1952, we began to use a combination of intramuscular streptomycin, oral isoniazid, and intrathecal isoniazid (this isoniazid was specially prepared by the Instituto Ibys Madrid). We have adopted the following plan to cover three months' treatment:

Intramuscular Streptomycin

Children under 2 years of age: 0·2–0·3 g. daily in one dose; for severe cases, up to 0·5 g.

From 2 to 10 years: 0·5 g. daily in one or two doses.

From 10 to 15 years: 1 g. daily in two doses for ten days; then 0·5 g. daily in one or two doses until the pyrexia subsides.

Adults: 1 g. daily in two doses until the pyrexia subsides.

Oral Isoniazid

Children under 2 years of age: 150 mg. daily.

From 2 to 10 years: 200 mg. daily.

From 10 to 15 years: 300 mg. daily.

Adults: 400 mg. daily.

Intrathecal Isoniazid

Children under 2 years of age: 10 mg. daily in a single dose.

From 2 to 10 years: 20–30 mg. according to the severity of the illness.

From 10 to 15 years and in adults: 30–50 mg. daily, beginning with 30 mg. and increasing the dose in 5 mg. steps.

This scheme is only a general guide and the doses may of course be changed according to the progress of the illness and the severity of any extrameningeal lesions. After more than 12,000 intrathecal injections, we have observed no intolerance to this treatment or difficulty in carrying it out. In all, the patients generally receive in the initial treatment 30–45 g. of streptomycin, 25–30 g. of isoniazid by mouth, and about 55 intrathecal injections—30 in the first month, 15 in the second, and 10 in the third.

Results

The results in the first 100 cases treated with this combination have been very encouraging, and there have been only 6 deaths.

Hitherto the disease had been almost invariably fatal, but we were now able to classify the cases into mild, moderate, and severe forms. The severity, it seemed, depended less on the meningeal lesion than upon any existing extrameningeal lesions and upon the constitutional resistance of the patient.

"*Mild*" cases responded rapidly: in a week patients would be free from meningeal and other signs, and though the cerebrospinal fluid (C.S.F.) was slower to respond, this did not seem to affect the excellent improvement in their general condition. In spite of this rapid response, we continued treatment for the full three months. These mild forms accounted for about 20% of cases.

In the "*moderate*" cases progress was much slower but none the less satisfactory. During the initial acute stage many patients were in deep stupor, and the first sign of improvement was usually the return, at times almost imperceptible, of contact with the outside world. This gradual awakening was usually complete after two or three weeks, but in some cases only after two months or longer. The acute phase was then followed by a period of one or two months during which the patients had no symptoms of any kind, though abnormalities of the C.S.F. persisted. In most patients with this moderate form the body-temperature curve is typical. A febrile phase lasting over three weeks, with daily variations of about one or two degrees, is followed by a second febrile phase lasting over four weeks; and thereafter the patient is afebrile. At the end of the second febrile phase the C.S.F. is noticeably improved; but it does not become normal for a further three months, during which time the patient has received no treatment whatever. About 65% of cases were in this "moderate" group.

The "*severe*" cases evolved more slowly and responded less satisfactorily to treatment. Successive febrile phases followed each other, and the general condition did not improve so rapidly as in the mild or moderate cases. The persistence of symptoms and signs was often due to extrameningeal lesions, especially abdominal tuberculosis. The period of convalescence was much longer. About 10% of cases were in this group, and it is among these that deaths are to be expected.

Sequelæ

The sequelæ have been mild. A child with hemiplegia of the right side recovered sufficiently to move the leg

muscles normally during convalescence, and though weakness of the hand muscles persisted, he could use his hand perfectly well. 6 patients had paresis of the tibialis anterior, giving rise to difficulties in walking. Another 3 patients dragged one foot on walking, but this improved and was not a serious disability. No sensory sequelæ were noted.

Follow-up

The suppression of the acute phase does not necessarily mean a permanent cure. Only time will tell how efficient this treatment really is and whether the present routine will have to be modified.

We have under observation 61 patients who have had no treatment for from three to seven months after the acute phase had been overcome by three months' combined therapy; 34 of them are at home and 27 are still in hospital. Those at home were allowed to leave hospital because the improvement in the C.S.F. gave grounds for confidence, and because home conditions were satisfactory. The 27 cases still in hospital consist of two groups: a smaller group of 6 patients who, though showing improvement in the C.S.F., were kept in hospital because they could not afford the journeys from their homes for monthly examination at the hospital; and a larger group of 21 in whom the C.S.F. did not improve as rapidly as in the other cases. The outlook for this second group does not seem good, and it is here that relapses have occurred. The 61 cases under review are summarised in the accompanying table.

RESULTS IN THE 61 PATIENTS WHO HAVE HAD THREE MONTHS OR MORE WITHOUT TREATMENT

PATIENTS DISCHARGED

Months without treatment	No. of cases	Cerebrospinal fluid			Relapses
		Normal	1–15 cells per c.mm.	15–30 cells per c.mm.	
7	5	4	1	0	0
6	13	2	7	4	0
5	8	2	5	1	0
4	5	1	3	1	0
3	3	0	3	0	0

PATIENTS STILL IN HOSPITAL

Months without treatment	No. of cases	Cerebrospinal fluid				Relapses
		Normal	0–20 cells per c.mm.	20–30 cells per c.mm.	Above 30 cells per cmm.	
7	8	0	4	0	4	4
6	5	0	0	0	5	2
5	10	2	3	1	4	2
4	2	0	0	1	1	2
3	2	0	1	0	1	0

The 10 relapses in 27 cases had an average clinical duration of ten days. There have been no deaths.

Relapses

Relapses have been mild, and in only 2 cases did meningeal signs reappear. All the others were indefinite febrile illnesses with inflammatory changes in the C.S.F. These relapses responded very well to further treatment.

This raises the question of preventive treatment in all cases where the cerebrospinal fluid does not rapidly return to normal and where, four months after the completion of initial treatment, the cell count is higher than 20. Indeed, in order to be doubly sure it would perhaps be advisable for all patients to undergo a second treatment. The doses, in adults, that we have begun to use in an attempt to prevent relapses are 20 g. of streptomycin (1 g. daily), 100 mg. of isoniazid by mouth in the morning, 100–150 mg. of isoniazid intravenously at midday, and another 100 mg. by mouth at night. From our experience we can confirm the effectiveness of this routine.

SUMMARY

A combination of intramuscular streptomycin and oral and intrathecal isoniazid has been used in the treatment of tuberculous meningitis. There have been 6 deaths in 100 cases treated in this way. Of the 94 patients who recovered, only 7 showed significant sequelæ, none of them involving serious disability. There have been 10 relapses, all mild and responding promptly to further treatment.

C.S.F.-ISONIAZID LEVELS IN TUBERCULOUS MENINGITIS

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THE ultimate test of any antibiotic or chemotherapeutic régime is that of clinical trial, however preliminary observations on the concentration of antibiotic or chemotherapeutic substances in various body-fluids is helpful in planning therapy. Elmendorf et al. (1952) have shown that isoniazid penetrates well into the cerebrospinal fluid (C.S.F.) of patients with active and arrested tuberculous meningitis, but the data are inadequate to decide the correct dosage.

The C.S.F.-isoniazid levels found in 15 adult patients, aged 16–41, with tuberculous meningitis are reported here. These levels were repeatedly determined in the patients throughout the course of the disease, while they were being treated with alternating high and low dosages of isoniazid. Present information suggests that a dose of 10 mg. of isoniazid per kg. of body-weight in twenty-four hours is the highest that is likely to be suitable for routine clinical use, and this level was selected for the high dosage. The Medical Research Council (1953a) showed that a dose of 200 mg. spread over twenty-four hours regardless of body-weight was virtually non-toxic to patients and clinically effective in pulmonary tuberculosis of adults. This dose was selected for the low dosage. The total 24-hour dose was administered half in the morning and half in the evening; patients on the higher dosage received two or three times as much isoniazid as when they were on the lower dosage.

Methods

Methods for the determination of isoniazid in body-fluids are as yet imperfect. To reduce error three methods were used in this investigation:

(1) *Biological method.*—Specimens were assayed with *Mycobacterium tuberculosis* H37Rv (human strains) as the test organism and with the media and precautions described by the Medical Research Council (1948). The presence or absence of growth was determined after fourteen days' incubation at 37°C, specimens being assayed in duplicate, and standards run in triplicate.

(2) *Method of Kelly and Poet (1952).*—The extraction into an iso-amyl alcohol-ether-ammonium sulphate system described for urine and plasma was found to be unsatisfactory when applied to C.S.F. Specimens of C.S.F., after protein precipitation with trichloracetic acid, were treated with *p*-dimethylaminobenzaldehyde reagent, and the resulting colour was estimated in a Spekker absorptiometer using 2 cm. cells and an Ilford 601 filter.

(3) *Method of Cuthbertson et al. (1953).*—The extraction into a butanol-ether-ammonium sulphate system had definite advantages over the extraction procedure of Kelly and Poet. However, experiments in this laboratory showed that this method of extraction did not give consistent results with C.S.F., in that with C.S.F. containing known amounts of isoniazid the extraction-rate varied between 55% and 80%, relatively less material being extracted at higher concentrations. Since the amount of interfering substances in the C.S.F. is less than in plasma, C.S.F. was directly treated with

picryl chloride after protein precipitation with acid sodium tungstate. The resulting colour was read with a Spekker absorptiometer using 4 cm. cells and an Ilford 603 filter.

ERROR OF METHODS

(1) *Biological*

Although the biological method of assay has obvious limitations, in an investigation such as this, where the chemical methods are relatively non-specific, biological assay provides an essential check against the possibility of estimating a biologically inactive metabolic derivative of isoniazid.

Chemical Methods

Effect of C.S.F.—Known quantities of isoniazid were dissolved respectively in water and in C.S.F. to give concentrations ranging from 0·5 to 4·0 μg. per ml., and isoniazid determinations were made on the specimens by both chemical methods. It was found that the values for isoniazid were lower when the material was dissolved in C.S.F. rather than in water. The error due to this cause varied from 5% to 15%. Triple determinations were made on each specimen at each concentration by both methods; the greatest deviation from the mean reading was 10%, while the average deviation from the mean reading was under 4%.

Effect of blank values.—C.S.F., after deproteinisation, gives a high blank value when treated with either of the reagents in question. Three separate determinations of blank values were obtained from each patient by stopping isoniazid seventy-two hours before the determination. Each blank value was used to correct the reading of the C.S.F.-isoniazid level in specimens taken before or after the blank determinations. The blank values by the picryl-chloride method were 0·9–2·3 μg. of isoniazid per ml. of C.S.F., and by the *p*-dimethylaminobenzaldehyde method 0·5–2·0 μg. of isoniazid per ml. of C.S.F. The differences between the three individual determinations for blank picryl-chloride values ranged from 0·1 to 0·9 μg. of isoniazid per ml. of C.S.F., average 0·3 μg. per ml.; and for the *p*-dimethylaminobenzaldehyde method from 0·1 to 0·8 μg. per ml., average 0·4 μg. per ml. Thus the question of the correct blank value was a matter of some uncertainty and a source of error, which did not exceed ± 0·5 μg. of isoniazid per ml. of C.S.F., and was likely to have been about ± 0·2 μg. per ml.

DIFFICULTIES WITH METHODS

Different batches of picryl chloride caused the development of the reaction colour to proceed at different speeds. In most cases the development of the full colour was obtained immediately, but in some cases the colour took some hours of standing to develop.* As a routine tubes were read at 2 and 12 hours to obviate this difficulty.

Certain batches of *p*-dimethylaminobenzaldehyde reacted with C.S.F. in the cold. All C.S.F. in which a cold reaction colour was found was discarded, since the differential analysis suggested by Kelly and Poet was found to be unsatisfactory.

p-aminosalicylic acid (P.A.S.) interferes with both reactions, and no patient was treated with P.A.S. Both methods were unaffected by the presence of streptomycin in the usual concentration, but the *p*-dimethylaminobenzaldehyde reagent reacted strongly with procaine. Piperocaine hydrochloride was used as a local anæsthetic for all lumbar punctures.

Results

To ascertain whether the methods were in agreement, determinations were made by all three methods on fourteen specimens of C.S.F. (streptomycin had been stopped seventy-two hours previously to allow the biological method to be used). The biological method gave values averaging 1·8 (range 0·5–4·0) μg. of isoniazid per ml. of C.S.F., the picryl-chloride method values averaging 1·5 (range 0·8–3·2) μg. per ml., and the *p*-dimethylaminobenzaldehyde method values averaging 2·2 (range 1·0–4·5) μg. per ml. The "t" test of significance showed $P > 0·1$. These figures suggested that the methods were in reasonable agreement, and that the chemical methods measured biologically active isoniazid. Further comparison between the *p*-dimethylaminobenzaldehyde and the picryl-chloride methods showed that the former gave results about 20% higher than the latter gave; but, when the results were tested statistically, the difference was not significant, owing to scatter.

* Cuthbertson et al. (1953) now believe that the full colour intensity will always develop immediately, provided that the picryl chloride reagent is purified by double recrystallisation from chloroform.

TABLE I—RISES IN C.S.F.-ISONIAZID LEVELS AT VARIOUS TIMES AFTER DOSE

Time after dose (hr.)	1–2	4–6	10–12	24
C.S.F.-isoniazid level (μg. per ml.) on daily dosage of 10 mg. per kg. of body-weight 12-hourly	1·4 (0·6–3·0)	3·6 (1·2–5·3)	0·6 (Detectable—1·8)	7/10 (Detectable)
C.S.F.-isoniazid level (μg. per ml.) on daily dosage of 200 mg. regardless of body-weight 12-hourly	1·0 (Detectable—2·8)	2·8 (1·0–3·6)	0·4 (Detectable—1·2)	4/10 (Detectable)

Each observation is the average of six readings (range in parentheses). Detectable = < 0·5 μg. per ml.

Specimens of lumbar C.S.F. were withdrawn from patients 1–12 hours after a dose of isoniazid. Readings after 24 hours were taken after omitting one dose. So that the patients should not be subjected to more than the one lumbar puncture a day necessary for treatment, curves showing the concentration of isoniazid at various times after a dose were constructed from samples on different days. Since there was a wide variation in the levels for any given patient, each of the points in table I was constructed from an average of six determinations on different patients, the ranges being shown in parentheses.

Table I shows that, after the oral administration of isoniazid a rise in the C.S.F.-isoniazid level was apparent within 1 or 2 hours, the peak being reached within 4–6 hours. (Data confirming the peak at 4–6 hours are not given in table I, because there were only three readings at 7–9 hours.) The C.S.F.-isoniazid level had fallen considerably 10–12 hours after ingestion of the dose, but at the end of 24 hours isoniazid was still detectable in some patients.

Table II shows the total number of determinations done 1–12 hours after a dose. The results show a wide scatter, as would be expected on the basis of the data in table I, and because some of the patients, being acutely ill with tuberculous meningitis, had troublesome vomiting. Patients who vomited after a dose of isoniazid were not given another dose, because the purpose of table II was to show the C.S.F.-isoniazid levels found in clinical practice. Analysis of the levels obtained when

TABLE II—NUMBER OF DETERMINATIONS MADE 1–12 HOURS AFTER DOSE OF ISONIAZID

C.S.F.-isoniazid level (μg. per ml.)	Not detected	0·0–0·49	0·5–0·99	1·0–1·49	1·5–1·99	2·0–2·49	2·5–2·99	3·0–3·99	4·0–4·99	5·0–6·50
Picryl chloride:										
On dosage of 10 mg. per kg. of body-weight 12-hourly	—	4	4	2	2	4	13	7	6	4
On dosage of 200 mg. daily	2	8	13	10	4	5	2	—	3	2
Dimethylaminobenzaldehyde:										
On dosage of 10 mg. per kg. of body-weight 12-hourly	—	—	—	2	3	—	2	4	—	6
On dosage of 200 mg. daily	—	4	3	3	7	1	1	5	—	1

the patients were acutely ill and less acutely ill (excluding patients who vomited) showed no striking differences, but patients with arrested tuberculous meningitis tended to show lower levels than did those with acute tuberculous meningitis (difference not statistically significant—$P > 0.1$).

Discussion

Analysis of the data in table II shows that there was a highly significant statistical difference between the C.S.F.-isoniazid levels obtained with the two dosages. These were higher ($P < 0.001$) when the higher dosage of 10 mg. per kg. of body-weight was given (for most patients this dosage was two or three times the amount given on the low dosage).

The 14-day inhibitory C.S.F.-isoniazid level for H37Rv is 0·06 μg. per ml., and it is rather generally accepted that most of the "isoniazid-sensitive" bacilli will be inhibited by a C.S.F.-isoniazid level 0·2 μg. per ml. (Medical Research Council 1953b).

Mackaness and Smith (1952) and Suter (1952) have shown independently by macrophage culture that, whereas the ratio of the inhibitory level of streptomycin for free tubercle bacilli to its inhibitory level for intracellular tubercle bacilli is 1 : 20–80, that of isoniazid is 1 : 1. This demonstration that the action of isoniazid is unimpaired when the tubercle bacilli are intracellular suggests that in-vitro tests with isoniazid may have considerable relevance to clinical treatment. The action of isoniazid on the tubercle bacillus is bacteriostatic rather than bactericidal, and probably little purpose is served by having very high levels of circulating isoniazid.

This contention is supported by the findings of Barclay et al. (1953) with isoniazid rendered radioactive with C^{14} in the carboxyl position. These workers showed that isoniazid levels higher than the lowest inhibitory level did not lead to a greater uptake of the isoniazid by the bacilli, and that reduction of the surrounding isoniazid level caused only a slow decrease of radioactivity in the bacterial cell. Isoniazid-resistant bacilli took up only minute quantities of isoniazid at all levels. These findings suggest that intermittent rather than continuous bacteriostatic levels of isoniazid may suffice for optimal therapy. It is realised that high C.S.F.-isoniazid levels do not necessarily either imply similar levels in the extracellular spaces of the brain or indicate high therapeutic activity.

Data given earlier show that if isoniazid is estimated in the presence of C.S.F., the values obtained are about 10% too low. Table II has not been altered to allow for this error, since the uncertainty about the blank value makes it inadvisable to apply a correction. Probably, after all allowances have been made for technical errors, levels of 0·5–0·99 μg. of isoniazid per ml. of C.S.F. or more in table II represent entirely adequate bacteriostatic levels of isoniazid. Since some of the readings in table II were made after the patients had vomited, and since this table incorporates estimations made twelve hours after a dose of isoniazid, the figures represent a conservative estimate of the C.S.F.-isoniazid levels likely to be obtained.

The 12 patients treated with 10 mg. of isoniazid per kg. of body-weight daily showed no evidence of toxicity due to this dosage for 4–8 weeks.

Table II shows that a dosage of 200 mg. daily in adults regardless of body-weight gives rise to C.S.F.-isoniazid levels that appear on theoretical grounds to be desirable, though the adequacy of this dose can only be established by clinical trial.

Debré and Brissaud (1952) have suggested that isoniazid should be administered both orally and intrathecally in tuberculous meningitis. The findings in the present investigation suggest that intrathecal isoniazid is unnecessary.

Summary

The C.S.F.-isoniazid levels were estimated in 15 patients with tuberculous meningitis in all stages of the illness. The patients received alternating high and low dosages of isoniazid.

The two chemical methods used were checked against a biological method to show that the chemical methods measured active isoniazid and not an inert metabolic derivative.

Adequate bacteriostatic C.S.F.-isoniazid levels were found on both dosages throughout the illness.

I wish to thank Dr. W. F. J. Cuthbertson, of the Glaxo Research Laboratories, and Dr. S. W. A. Kuper, of the Brompton Hospital, for providing me with details of the picryl-chloride method for the determination of isoniazid; and Mr. J. Tobar for technical assistance in the laboratory.

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ANÆMIA ASSOCIATED WITH HÆMOPHILUS INFLUENZÆ MENINGITIS

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IN a survey of 1069 histories of acute meningitis in infants and children admitted to the Children's Hospital, Melbourne (Rubbo et al.), our attention was drawn to the extensive use of blood-transfusions in *Hæmophilus influenzæ* meningitis. This observation led to an examination of the frequency and severity of anæmia in this disease and in meningococcal meningitis. The results are presented here.

Investigation

It is generally recognised that 50–60% of anæmias in infants and children are secondary to infection (Baty 1947, Diamond 1950), but significant anæmia has not usually been observed in acute infections of less than a month's duration (Cartwright and Wintrobe 1952). Our finding of a frequent association of anæmia with influenzal meningitis clearly shows that this complication may be

TABLE I—STANDARDS USED FOR CLASSIFYING DEGREE OF ANÆMIA IN CHILDREN

Age-group	Normal Hb level (g. per 100 ml.)	Degree of anæmia		
		Mild < 85% of normal (g. per 100 ml.)	Moderate < 75% of normal (g. per 100 ml.)	Severe < 65% of normal (g. per 100 ml.)
0–3 mos...	15 (*104%*)	11·9 (*82%*)	10·5 (*72%*)	9·1 (*63%*)
4–12 mos.	12 (*83%*)	10·2 (*70%*)	9·0 (*62%*)	7·8 (*54%*)
13–24 mos.	12·5 (*86%*)	10·6 (*73%*)	9·4 (*66%*)	8·1 (*56%*)
2 yr. or more ..	13 (*90%*)	11·0 (*76%*)	9·8 (*68%*)	8·5 (*59%*)

Hb in peripheral whole blood 14·5 g. per 100 ml. = 100%.

TABLE II—ANÆMIA IN ACUTE MENINGITIS IN CHILDREN

Ætiology	No. of cases	No. of cases with anæmia	Cases given blood-transfusion (%)
H. influenzæ ..	196	89 (45·4%)	37·7 *
N. meningitidis	141	11 (7·8%)	4·3

* Includes 14 cases given blood-transfusions but not included in anæmic group, because Hb estimations were not recorded.

observed in acute, as well as in chronic, infections. Apart from isolated statements, such as that of Turner (1948), who reported that 7 of her 40 cases of *H. influenzæ* meningitis required blood-transfusion, the association of anæmia with influenzal meningitis seems to have escaped attention. We report here the results of a study of 208 bacteriologically proven cases of *H. influenzæ* meningitis, of which 196 were consecutive cases admitted to the Children's Hospital in 1946–52. For comparison, we refer to a series of 141 cases of meningococcal meningitis treated in the same hospital over the same period.

It was appreciated at the outset of this study that any estimate of the frequency of anæmia would depend on the hæmoglobin level chosen as the criterion of anæmia. The level chosen was 85% of the expected normal level, after correction for the patient's age, in the peripheral blood, 14·5 g. of hæmoglobin per 100 ml. of blood being taken as equivalent to 100% hæmoglobin. The hæmoglobin levels for assessing the degree of anæmia in various age-groups are shown in table I.

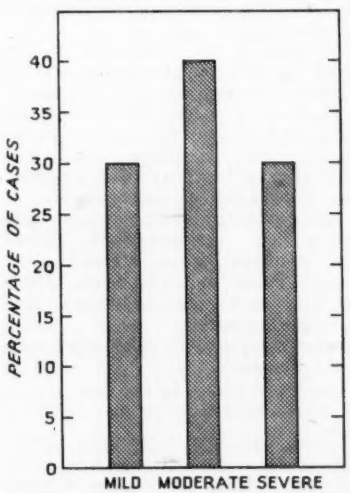

Fig. 1—Severity of anæmia in 89 cases of *H. influenzæ* meningitis.

Results

With this classification 89 of the 196 consecutive patients with *H. influenzæ* meningitis (45%) were anæmic on admission to hospital or developed anæmia within seven days of admission. This surprisingly high incidence is probably a conservative estimate, for it does not include 14 patients who received blood-transfusions, or the many patients given oral iron therapy who were not classifiable because hæmoglobin estimations were not recorded. In contrast, the incidence of associated anæmia in meningococcal meningitis was 7·8%. These differences (table II) suggest that anæmia of meningitis may be peculiar to *H. influenzæ* infection.

As regards the severity of this anæmia, fig. 1 shows that in 70% of the anæmic patients the anæmia was moderate or severe—i.e., the concentration of hæmoglobin was less than 75% and 65% of the corrected normal value respectively. In some cases the anæmia was well below these critical values and in 16% (18 patients) the hæmoglobin was equal to or less than 7·3 g. per 100 ml. (fig. 2).

Thus, anæmia in *H. influenzæ* meningitis is not only frequent but also moderately severe. From the clinical standpoint it can be easily corrected, and, if recognised, it does not appear to affect the prognosis, particularly with the modern chemotherapeutic control of the meningitis. In 1946–52 the over-all case-fatality rates among anæmic and non-anæmic patients were 14·3% and 13·2% respectively.

The mechanisms causing anæmia during infection fall broadly into three main groups—aplasia of hæmopoietic tissue, intravascular hæmolysis, and maturation arrest in the synthesis of hæmoglobin (Saifi and Vaughan 1944). We cannot offer any experimental evidence of its significance in *H. influenzæ* infection, but the following observations are relevant.

There appears to be a definite relation between the degree of anæmia and the severity of the infection

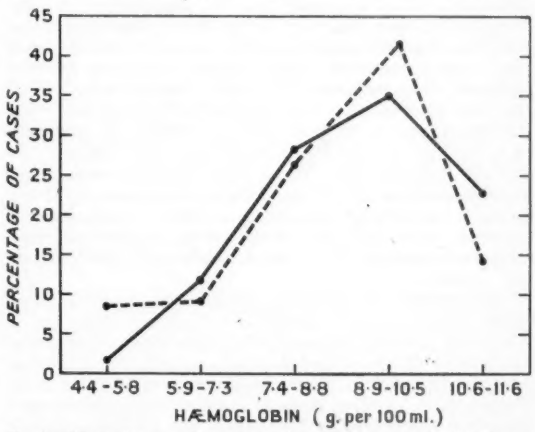

Fig. 2—Effect of serum therapy on degree of anæmia in *H. influenzæ* meningitis: solid line, 54 cases without serum therapy; interrupted line, 55 cases with serum therapy.

measured by the concentration of glucose in the cerebrospinal fluid (C.S.F.) (Alexander 1943). This relation is brought out in table III, which shows that anæmia was present in 57% of all severe infections (C.S.F.-glucose level below 10 mg. per 100 ml.), in 40% of moderate infections, and in 30% of mild cases.

That the age of the patient did not affect the frequency of the anæmia was shown by the almost identical age-distribution of anæmic and non-anæmic patients: 69% of all the patients and 71% of the anæmic patients were aged less than 1 year.

The blood-group of the patient had no apparent influence on the incidence or degree of anæmia; for a normal distribution of blood-groups A, B, O, and AB, and of the Rh factor was found among the anæmic patients.

It was impossible, with the information available, to determine whether an incipient anæmia of dietary or other origin preceded, or was aggravated by, the infection. Most of the patients came from the industrial (lower economic class) areas of the city, but the same social distribution applied to cases of meningococcal meningitis, in which anæmia was uncommon.

The question was raised whether the administration of type-b rabbit antiserum might be causally related to the development of anæmia. That this was not so is shown in fig. 2, in which the degree of anæmia in two groups of

TABLE III—RELATION BETWEEN DEGREE OF ANÆMIA AND SEVERITY OF INFECTION IN H. INFLUENZÆ MENINGITIS

Degree of infection	C.S.F.-sugar-level (mg. per 100 ml.)	No. of cases	Association with anæmia (%)				
			None	Mild	Moderate	Severe	All grades
Severe ..	< 10	76	43	17	16	24	57
Moderate	10–30	30	60	17	23	0	40
Mild ..	30–50	24	80	8	4	8	36

anæmic patients, one group treated with the antiserum (usually intramuscular) and the other not, showed much the same distribution. Thus there was no evidence that serum therapy induced hæmolysis or agglutination, thereby increasing the severity or precipitating the anæmic syndrome.

Discussion

We have been able to show that anæmia is often associated with *H. influenzæ* meningitis but seldom with meningococcal meningitis (table II). This finding is of some interest in so far as many hæmatologists consider that significant anæmia is not seen in acute infections of short duration. The frequency of the association in 196 consecutive cases was 45%, after the exclusion of those patients whose hæmoglobin levels were not recorded but who were treated by either blood-transfusion or iron therapy. A conservative estimate would be that half of the cases present with anæmia or develop anæmia during the illness, and in 70% of these the anæmia is moderate or severe (fig. 1). In the present series two-thirds of the anæmic patients (38% of all the patients) were given blood-transfusion (table II). Whereas the severity of the anæmia was partly influenced by the severity of the infection (table III), age, blood-group, social class, and antiserum therapy (fig. 2) did not affect the incidence or the severity.

The question whether the anæmia was a predisposing cause or the result of specific infection is entirely open. We noted that the anæmia often developed during the course of the illness, and not infrequently the hæmoglobin level rapidly fell in twenty-four to forty-eight hours. These sudden changes seem to indicate that mechanisms involving intravascular hæmolysis are at work during infection. Unfortunately no complete observations on pigment balance were recorded in the histories. A tentative suggestion is that sensitisation of the cells by *H. influenzæ* polysaccharide (Keogh et al. 1947) might lead to subsequent hæmolysis by a naturally occurring lytic component (e.g., complement) or by chemotherapeutic agents in circulation (e.g., sulphonamides).

Summary

An analysis of 196 consecutive cases of *H. influenzæ* meningitis in infants and children revealed that 45% had an associated anæmia, and in 70% of these the anæmia was moderate or severe. In contrast, the incidence of an associated anæmia in 141 cases of meningococcal meningitis was only 8%.

The anæmia was more frequently associated with the severer forms of meningitis but was not related to the patient's age, blood-group, or social class, or caused by the administration of type-b rabbit antiserum.

From a clinical point of view this association with anæmia should always be considered in the management of *H. influenzæ* meningitis. The anæmia did not affect the fatality-rate, probably because it was recognised and treated (two-thirds of the anæmia patients were given blood-transfusions).

Possible mechanisms and the significance of anæmia in *H. influenzæ* meningitis are briefly discussed.

Our thanks are due to Miss A. A. Robbins, of the records office of the Children's Hospital, Melbourne, for her coöperation; to Dr. V. L. Collins, medical director, for giving us access to case-histories; to our colleague Miss Patricia Gladwell; and to the Medical Research Funds for a grant to one of us (D. J. S.).

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LACTOSURIA AND GLYCOSURIA IN PREGNANCY AND THE PUERPERIUM

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THE application of paper partition chromatography (Consden et al. 1944) to the identification of sugars in urine, first described by Horrocks and Manning (1949), marked an important advance in clinical chemistry. Conventional methods of identification of urinary reducing substances by yeast fermentation and osazone formation are notoriously insensitive in practice and often yield equivocal results. Paper partition chromatography enables reducing substances to be identified with certainty even when present in low concentration, and the presence of more than one sugar may be shown by a single test.

With the introduction of this technique in our laboratory lactosuria was found to be very common in pregnancy, being more common than glycosuria. Since this finding was at variance with current views, it was thought desirable to reinvestigate the occurrence of lactosuria and glycosuria in pregnancy.

The frequent occurrence of glycosuria during pregnancy is generally recognised; indeed its appearance after a dose of glucose was at one time suggested as a diagnostic test for pregnancy (Welz and Van Nest 1923, Hirst and Long 1926). Lactosuria has been known to occur during lactation since Hofmeister (1877–78) first isolated lactose from urine, but most of the standard textbooks of clinical chemistry emphasise the rarity of lactosuria before delivery (Bodansky and Bodansky 1952, Cantarow and Trumper 1949, Duncan 1947, Harrison 1947). Hawk et al. (1947), however, state that lactose is found in the urine in pregnancy, and Peters and Van Slyke (1946) mention that it is not uncommon to find traces of lactose in the later months of pregnancy.

Reference to the earlier reports about lactosuria before delivery shows lack of agreement:

Lemaire (1895–96) identified lactose in the urine during lactation by osazone formation, but before parturition he could only detect glucose.

Porcher and Commandeur (1904) identified lactose in the urine of a few women both before and after delivery.

Williams and Wills (1928), using the osazone method, found no lactosuria before delivery in 21 clinically normal pregnancies in which sugar was present in the urine.

Watkins (1928) claimed to have shown that small quantities of lactose were constantly present in the urine during the last stages of pregnancy, and that its excretion was suddenly increased just before delivery; however, he did not identify the sugar but assumed that increase of the non-fermentable reducing substance represented lactose.

Winter (1931), who recognised lactose by increased reduction after controlled hydrolysis as well as by the optical rotation and melting-point of the isolated sugar, found only glucose in the urine before parturition and only lactose after delivery.

Brock and Hubbard (1935) used a method of great sensitivity and specificity to estimate the urinary sugars, determining the reducing power colorimetrically after differential bacterial fermentation; they showed lactose to be present in small amounts in a large proportion of pregnant women, sometimes even in the early months.

Archer and Haram (1948), using Fearon's methylamine test, found not a single positive test for lactose in 777 antenatal specimens of urine from 123 patients, although lactose was found in the urine of 86 of 97 postnatal patients.

Odin and Werner (1950), using paper chromatography, demonstrated lactose in the urine of 9 of 10 pregnant women. (Zilliacus and Roos 1952), also using paper chromatography, found lactose in the urine of 21 of 83 pregnant women, in 1 case as early as 3 months.

Clinical Data

Control Patients

Single specimens of urine were obtained from 372 unselected patients, 240 non-pregnant females and 132 males, to act as controls. Most of these specimens were from inpatients and outpatients attending University College Hospital, but a few were obtained from healthy young adults. The age-distribution of these patients and the time of voiding the specimens were not standardised.

Antenatal Patients

Specimens of urine were obtained from 245 patients attending the antenatal clinic of the hospital. These patients were unselected in that they were booked consecutively in the antenatal department; an undue proportion of primigravidæ is included because these are given priority for admission. Specimens were obtained from each patient at every attendance at the clinic—i.e., normally at the first attendance and then at monthly intervals until 32 weeks, fortnightly between 32 and 36 weeks, and thereafter weekly. No specimens were obtained before the 8th week of pregnancy. Usually, therefore, 12 specimens were expected from each patient. In practice the full quota was not always obtained, because of either non-attendance at the clinic or failure to collect the specimens. Specimens from patients attending the morning and afternoon clinics were voided between 9 and 10.30 A.M. and between 1 and 2.30 P.M. respectively. The following details were abstracted from the patients' antenatal notes: date of last menstrual period, age, number of previous pregnancies, number of live births, and whether the patient had diabetes mellitus or any form of pregnancy toxæmia. The duration of pregnancy was calculated from the first day of the last menstrual period; in only a few instances were these calculations corrected when clinically this date was considered to be a month out.

Postnatal Patients

Clean specimens of urine were obtained from the patients followed antenatally on the second, fourth, and eighth days after delivery while in hospital, and later at 6 weeks and at any subsequent attendances at the postnatal clinic. The former specimens were voided about 6 A.M. and the latter between 1 and 3 P.M.

Methods

Every specimen of urine had its specific gravity determined and was submitted to a qualitative Benedict test and to chromatographic analysis. While awaiting chromatography it was stored at 4°C.

Specific Gravity

This was measured with specific-gravity beads, the same set being used for all the determinations.

Qualitative Benedict Test

This was performed and assessed in a standard manner as follows:

Exactly 0·5 ml. of urine and 5·0 ml. of Benedict's qualitative reagent (Benedict 1908–09) were pipetted into test-tubes and mixed by shaking. The rack holding the tubes was lowered into a boiling water-bath for 5 minutes. On removal, any red, orange, yellow, or obvious green reductions were recorded as such. Green reductions were subdivided into green 2 and green 1, according to whether the colour was a yellowish green or a bluish green. Thereafter the tubes were allowed to stand until sedimentation was complete. The precipitate was then examined in those tubes as yet ungraded; if there was none, or if it was grey, the test was recorded as blue (or negative), whereas if any yellow component was present reduction was recorded as green 1. With this technique the sensitivity of the test was such that glucose and lactose added to urine which had previously not reduced Benedict's reagent could be detected in concentrations as low as 10 and 15 mg. per 100 ml. respectively.

Chromatography

The general technique of Horrocks and Manning (1949) was followed, with some modifications:

As a routine 20 µl. of urine was spotted on the strips of filter paper; occasionally 40 µl. or more was applied when the urine was unusually dilute. Since absolute temperature control could not be achieved, marker strips spotted with known sugars were run at the same time to establish the R_f values under the prevailing conditions. Normally the 4 : 1 : 5 n-butanol-acetic acid-water solvent of Partridge and Westall (1948) was used; but, since this solvent does not separate lactose from maltose, and glucose from galactose, one or two specimens of urine from each patient were also run with the collidine-lutidine-water solvent used by Dent (1948) for amino-acid chromatography. The latter solvent separates these pairs of sugars widely; but, since the colour of the sugar spots is not so intense, 80 µl. of urine was applied to the strips developed with this solvent. Immediately after development of the colour the quantity of the sugar present was estimated by visual matching of the spots with standard charts. These permanent colour charts, one for lactose and one for glucose, were constructed by carefully matching spots obtained on standard chromatograms. The accuracy of this method of estimation was determined by running 200 strip chromatograms spotted with a complete range of sugar concentrations; it was shown that 75% were correctly assessed to within ±33% of the actual value of the colour standard.

The spray reagent used to show up the reducing sugars on the chromatograms is prepared by dissolving 1·25 g. of *p*-phenylene-diamine and 3·0 g. of stannous chloride in 200 ml. of ethyl alcohol and 50 ml. of glacial acetic acid. After standing for half an hour the reagent is filtered. Normally it was used three hours after preparation, but it will remain stable at room-temperature for two or three days. The incorporation of stannous chloride delays the appearance on the paper of a background colour which develops after the paper has been heated or exposed to light. After the freshly sprayed chromatogram has been heated in an air oven at 105°C for 15 minutes, hexoses show up as brown spots and glucuronates and pentoses as red spots; urates do not react. The intensity of the colour reaction with this reagent is such that lactose and glucose can be detected in concentrations of 17 and 14 mg. per 100 ml. respectively when 20 µl. of the solution is applied to the chromatogram run with the n-butanol-acetic acid-water solvent.

Analysis of Results

The clinical and laboratory data were analysed with the aid of punch cards. The urinary findings were grouped as indicated in the accompanying tables and figures. Where more than one specimen of urine from a given patient was examined in a particular period—e.g., 34–35 weeks inclusive—the results were averaged before transference to the cards. Since 24-hour specimens of urine were not available, the quantitative sugar values were corrected for the variable dilution factor of the specimens by referring the figures to an arbitrary standard specific gravity of 1·020. Thus, a urine of sp. gr. 1·010 assessed as containing 150 mg. of lactose per 100 ml. would on correction be assigned a concentration of lactose of 300 mg. per 100 ml.

Results

Results of Benedict Tests

The over-all results are given in table I, which shows that the frequency of urines giving positive reduction tests in pregnancy is about 2½ times, and in postpartum patients about 3 times, that in the controls. They also indicate that it is only in the puerperium that the incidence of the heavier reductions of Benedict's solution is much increased.

The results of the Benedict tests at different stages of pregnancy and the puerperium are further analysed in fig. 1. It will be noted that the percentage of specimens giving no reduction falls from about 40% at 8–11 weeks to about 21% at 40 weeks. The other notable change is the increase in the incidence of the heavier reductions, which begins at about 28–31 weeks and persists until

TABLE I—OVER-ALL RESULTS OF BENEDICT TESTS

Source of urine	No. of specimens tested	Percentage of negative Benedict tests	Percentage of positive Benedict tests		
			G_1	G_2	Ye. & Or.
Female controls ..	240	71·3	25·4	3·3	..
Male controls	132	64·4	31·1	4·5	..
Antenatal patients* ..	2373	27·1	68·5	3·9	0·5
Postnatal patients* ..	657	12·2	69·2	17·7	0·9

* The findings in one patient, shown subsequently to be mildly diabetic, are not included.

delivery. On the second day of the puerperium there is a slight increase in the incidence of reductions; by the fourth day only 2·4% of specimens show no reduction and 35% show heavy reductions. Six weeks after delivery 10% still show a green-2 reduction.

Chromatography Results

The over-all results are shown in table II. The collidine-lutidine runs showed that in no case was maltose or galactose present in those urines examined.

It will be noted from table II that about 9% of the controls, both male and female, had detectable quantities of lactose in their urine, and that lactosuria was found at no less than 50% of the antenatal patient attendances, the frequency of lactosuria being double that of glycosuria. The other notable finding is the remarkably low incidence of glycosuria after delivery, an incidence even lower than that found in the controls.

The chromatography results in the pregnant women are further analysed in fig. 2. These results show that:

(1) The incidence of lactosuria increases steadily from the third month of pregnancy until 34–35 weeks, when 64% of the patients show lactosuria. Thereafter there appears to be no significant change.

(2) Lactosuria is more common after delivery, 99% of patients having detectable quantities of lactose four days after delivery.

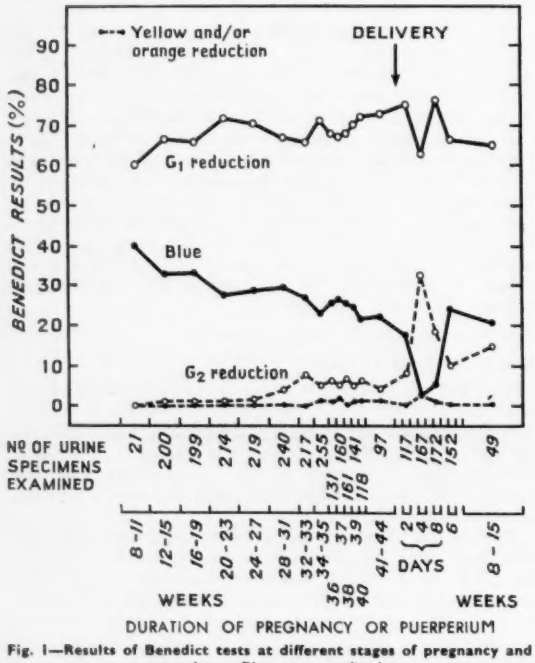

Fig. 1—Results of Benedict tests at different stages of pregnancy and puerperium. Blue = no reduction.

(3) The amount of lactose excreted is usually less than 100 mg. per 100 ml. before delivery and more than 100 mg. per 100 ml. during the early puerperium.

(4) The incidence of glycosuria rises sharply after the third month and fluctuates between 20% and 31% for the remainder of the pregnancy.

(5) The glycosuria of pregnancy disappears abruptly after delivery, no urinary glucose being found on the eighth day after delivery or thereafter.

(6) The quantity of glucose excreted during pregnancy is usually less than 67 mg. per 100 ml.

(7) After 16–19 weeks' pregnancy lactosuria is more common than glycosuria.

To discover the constancy or otherwise of lactose and glucose excretion during pregnancy, the findings in 127 patients from whom specimens were obtained at ten or more of the antenatal attendance periods (weeks 41–44 counting only as one attendance period) were analysed. In only 8 (6%) of these patients did lactosuria never occur, whereas 42 (33%) never had glycosuria at any time. Lactosuria was found at every antenatal attendance in 5 patients (4%) and glycosuria constantly in 3 patients (1 of these 3 patients was subsequently proved to have mild diabetes mellitus). Of the 119 patients who showed lactosuria, lactose was detected in 61 (51%) on six or more occasions; whereas of the 85 who showed glycosuria, in 42 of the patients (49%) the sugar was detected only on one or two occasions. In most of the patients, therefore, lactosuria and glycosuria occur as intermittent phenomena.

TABLE II—OVER-ALL RESULTS OF CHROMATOGRAPHIC ANALYSES

Source of urine	No. of patient attendances	Percentage of patient attendances with lactosuria found (with or without glycosuria)	Percentage of patient attendances with glycosuria found (with or without lactosuria)*	Percentage of patient attendances with both lactosuria and glycosuria found*
Female controls ..	240	9·6	14·2	6·2
Male controls ..	132	8·3	15·9	3·8
Antenatal patients	2174	50·9	24·0	15·8
Postnatal patients	649	86·2	0·9	0·8

* The findings in one patient, shown subsequently to be mildly diabetic, are not included.

Investigation of Mechanism

In an attempt to elucidate the mechanism responsible for lactosuria and glycosuria in pregnancy the incidence of the excretion of lactose and glucose was compared in groups of patients selected from the 127 from whom 10 or more specimens had been obtained. In every case the groups compared consisted of the maximum of patients in whom the incidence of all but one of the following variables was identical: age-group (under 20, 20–24, 25–29, 30–34, 35–39, 40 or more), number of previous abortions (0, 1, or 2), number of children (0, 1, 2, or more than 2), clinics attended (A.M. or P.M.), occurrence of toxæmia (no toxæmia, slight pre-eclamptic toxæmia, definite pre-eclamptic toxæmia, or essential hypertension). The results are shown in tables III–VI. The "distribution correction" in these tables shows to what extent the differences found are likely to be attributable to the groups not being exactly similar in terms of numbers of specimens examined at particular periods of pregnancy. Thus, in table III part of the difference in the over-all incidence of lactosuria between the two groups is due to the fact that 8 of the A.M. clinic patients attended at 8–11 weeks (when the expected incidence of lactosuria is only 9·5%) and 6 at 41–44 weeks (when the expected incidence of lactosuria is 53·2%), whereas only 1 of the P.M. clinic patients attended at 8–11 weeks and 11 at 41–44 weeks. By applying the distribution correction,

differences due to such inequalities are eliminated. The correction factors were calculated from a knowledge of (1) the numbers of patients providing specimens at particular periods of pregnancy, and (2) the expected incidence of the sugar excretion at each particular period (fig. 2).

In table III the effect of the time of day on sugar excretion is shown. It can be seen that the incidence of glycosuria, and to a lesser extent of lactosuria, is higher in the patients attending the afternoon clinic.

In table IV the effect of previous pregnancies is shown. This table shows that the incidence of the excretion of both sugars is lower in those who have borne children. This finding was elaborated by comparing the results in three groups of 10 patients: with no children, with one child, and with more than one child. The results confirmed the above-mentioned finding and suggested that the incidence of lactosuria diminishes with increasing numbers of successful pregnancies, the corrected percentage of patient attendances with lactosuria being 56·0, 50·5, and 31·7 respectively.

In table V the effect of age is shown. From these data it seems that age has no effect on the incidence of lactosuria, but that the frequency of glycosuria probably increases with age.

In table VI a comparison is made between a group of 44 patients with toxæmia and a similar group of 44 without any form of pregnancy toxæmia. Of the patients with toxæmia 4 had definite pre-eclamptic toxæmia requiring admission to hospital, 4 had essential hypertension, and the remaining 36 had only a slight degree of pre-eclamptic toxæmia as defined by Browne (1947). The results show that there is no connection between the milder varieties of toxæmia and sugar excretion in pregnancy.

TABLE III—COMPARISON OF SUGAR EXCRETIONS IN PATIENTS ATTENDING MORNING AND AFTERNOON ANTENATAL CLINICS

—	Patients attending		Distribution correction for P.M. clinic group
	A.M. clinic	P.M. clinic	
No. of patients in group	24	24	..
No. of patient attendances	262	267	..
Percentage of patient attendances with lactosuria	42·7	54·4	−1·7
Percentage of patient attendances with glycosuria	14·1	25·8	+0·4

It is well known that postnatal lactosuria and lactation are related, but it was noted that lactose excretion occurred quite frequently in mothers not feeding their infants. Because of this we compared the incidence of lactosuria in breast-feeders and in non-breast-feeders. The results are shown in fig. 3, the number of patients concerned being shown in table VII. The small number of non-breast-feeders makes comparison of the two groups unsatisfactory. However, it seems that the incidence of lactosuria up to eight days after delivery is comparable in the two groups, although lower concentrations of lactose were found in the urine of the non-breast-feeders. The incidence of lactosuria six weeks after delivery is about three times as great in breast-feeders.

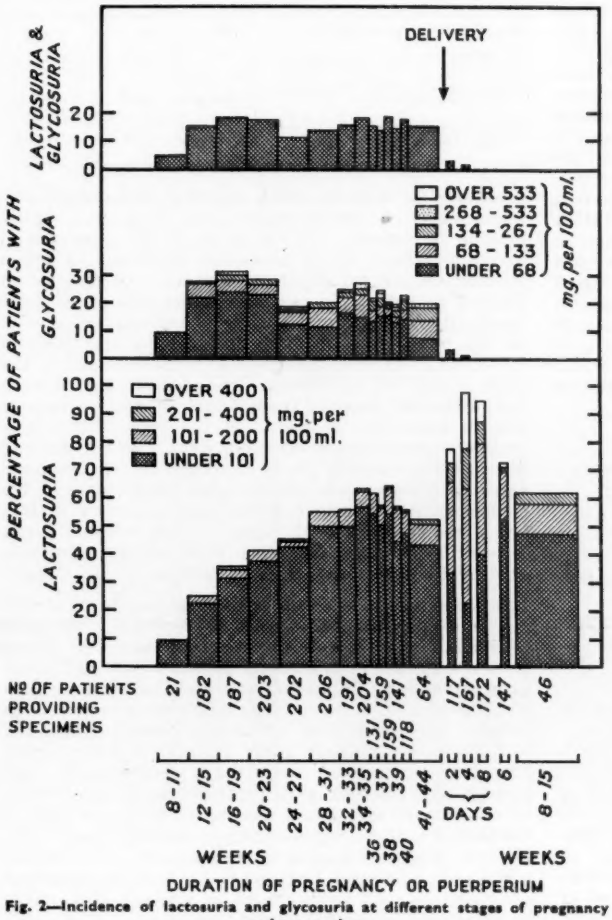

Fig. 2—Incidence of lactosuria and glycosuria at different stages of pregnancy and puerperium.

Discussion

Results of Benedict Tests

The results recorded here confirm the well-established fact that the concentration of urinary reducing substances is often increased in pregnancy and the puerperium. However, the incidence of urine giving positive Benedict tests is considerably in excess of that recorded by other workers in the controls and antenatal and postnatal groups (Williams and Wills 1928, Richardson and Bitter 1932, Brock and Hubbard 1935, Weidin 1948). The results obtained by Archer and Haram (1948) are nearest akin to ours; they found reduction by 64% of 777 specimens of antenatal urine, 81% of 258 specimens of postnatal urine, and 11% of 503 control specimens of urine. The discrepancies are probably due to differences in technique. Precise measurement of the urine and reagent, use of a boiling water-bath for 5 minutes, and standing the tubes until sedimentation is complete are particularly important if small quantities of reducing substances are not to be missed. The importance of technique is shown by the differing opinions on the sensitivity of the test; Watkins (1928) found that urine with more than 150 mg. of sugar per 100 ml. usually gave a positive test, whereas Brock and Hubbard (1935) and Weidin (1948) found that all urine with 60 mg. or more of glucose per 100 ml. gave positive tests. Most textbooks of biochemistry state that the test will detect glucose down to a concentration of 100 mg. per 100 ml. We were surprised to find that we could detect lactose and glucose at much lower concentrations. In this connection it is significant that sugar was

TABLE IV—COMPARISON OF SUGAR EXCRETIONS IN PATIENTS WITH AND WITHOUT CHILDREN

—	Patients with no children	Patients with children	Distribution correction for children group
No. of patients in group ..	29	29*	..
No. of patient attendances ..	321	322	..
Percentage of patient attendances with lactosuria	61·1	42·6	+0·7
Percentage of patient attendances with glycosuria	26·1	17·7	+0·1

* Of these patients 20 had 1 child, 7 had 2 children, 1 had 3, and 1 had 6.

recorded as having been detected at the clinic in only 2 of the antenatal specimens of urine ; our findings on the same specimens were 1625 green-1 reductions and 104 green-2 or heavier reductions. At the clinic urine is tested for sugar by the Benedict test, but the quantities are not measured precisely, the tube is heated over a bunsen flame, and the result is recorded immediately.

The results of the Benedict tests show a progressive rise in the percentage of positive tests as pregnancy proceeds. Richardson and Bitter (1932) and Weiden (1948) found a uniform incidence throughout, but they examined fewer specimens.

Chromatography Results

The results of the chromatographic analyses confirm the findings of Brock and Hubbard (1935) that lactosuria occurs not only during lactation but also in a large proportion of pregnant, and a small number of non-pregnant, women. Our results also establish that lactosuria occurs in a few men taking a normal diet. Lactosuria has previously been reported as occurring in men after ingestion of 10 g. or more of pure lactose (Folin and Berglund 1922, Watkins 1928, Winter 1931), but the methods of identification were not entirely satisfactory.

As indicated earlier, the finding of many workers that lactosuria in antenatal patients occurs either not at all or only towards the closing stages of pregnancy can be attributed to the use of methods of sugar identification which are of insufficient delicacy. As can be seen from fig. 2, the concentration of lactose present was almost always less than 100 mg. per 100 ml., and indeed in most cases it was so low as to be near the limit of

TABLE V—COMPARISON OF SUGAR EXCRETIONS IN DIFFERENT AGE-GROUPS

—	Patients aged 20–29	Patients aged 30–39	Distribution correction for group aged 30–39
No. of patients in group	25*	25†	..
No. of patient attendances ..	284	269	..
Percentage of patient attendances with lactosuria	46·1	46·8	+0·1
Percentage of patient attendances with glycosuria	11·6	25·6	+1·3

* Of these patients 7 were aged 20–24 years and 18 were 25–29.
† Of these patients 17 were aged 30–34 years and 8 were 35–39.

sensitivity of the method—i.e., about 20 mg. per 100 ml. In the controls also the amount of lactose was minimal.

The sensitive and specific method adopted by Brock and Hubbard (1935) is alone satisfactory for the purpose of comparing our lactose results with those obtained by others. Their method enabled as little as 10 mg. per 100 ml. to be determined quantitatively with great accuracy. They found lactose in concentrations of 10–13 mg. per 100 ml. in 3 of 24 specimens from non-pregnant women, 20–99 mg. per 100 ml. in 21 of 42 antenatal specimens of urine, and 20–399 mg. per 100 ml. in 9 of 11 postnatal specimens of urine. These results closely resemble our own. The fact that we found lactose in 9% of controls, when our method cannot detect less than 17 mg. of lactose per 100 ml., could be due to our examining a larger number of specimens, to the inclusion of patients outside the age limits of 18–45 years, and to dietary differences. In some cases we found higher concentrations of lactose than did Brock and Hubbard (1935) ; this is certainly partly explained by our correction of the quantitative figures to a specific gravity of 1·020, which is probably higher than average normal.

Our figures relating the incidence of lactosuria to duration of pregnancy and puerperium establish that the frequency of lactose excretion increases with duration of pregnancy between 12 and 35 weeks, and confirm the finding of Watkins (1928) that the amount of lactose excreted after delivery often increases to reach a peak about the fourth day. The findings of Brock and Hubbard (1935), that lactosuria may not be present late in pregnancy and may persist long after delivery, are also confirmed.

Apart from our finding that glycosuria occurs about $1^1/_2$ times as frequently during pregnancy as in controls, our results concerning glucose excretion do not conform

TABLE VI—COMPARISON OF SUGAR EXCRETIONS IN PATIENTS WITH AND WITHOUT TOXÆMIA

—	Patients without toxæmia	Patients with toxæmia	Distribution correction for toxæmia group
No. of patients in group	44	44	..
No. of patient attendances ..	488	498	..
Percentage of patient attendances with lactosuria	47·1	47·8	−0·6
Percentage of patient attendances with glycosuria	22·9	20·7	−0·3

so closely to those of Brock and Hubbard (1935), who found glucose in concentrations over 14 mg. per 100 ml. in 9 of 24 controls, in 32 of 42 antenatal specimens of urine, and in 7 of 11 postnatal specimens of urine. Richardson and Bitter (1932), who used a fermentation method to detect glucose, also found this sugar more frequently ; they found glucose in concentrations over 14 mg. per 100 ml. in 31 of 50 antenatal specimens of urine and in 15 of 50 specimens of urine obtained on the twelfth day after delivery. The discrepancy between our results and those of these American workers may be due to differences in diet. In the case of the early puerperal specimens of urine our finding so few cases of glycosuria is certainly partly explained by our obtaining these specimens while the patients were fasting. We confirm that glycosuria occurring early in pregnancy does not always persist until term, a view originally put forward by Williams and Wills (1928) but not substantiated by Richardson and Bitter (1932) or Weiden (1948).

Relation of Benedict Results to Chromatography Findings

The significance of a positive Benedict test is of considerable import to both patient and clinician. There is no doubt that even strongly positive tests during the puerperium may be normal and are due almost exclusively to lactose. Unfortunately it is difficult to determine to what extent positive tests during pregnancy are due to lactose or glucose, since glucuronate was found extremely often, with or without these sugars, and occasionally fructose and pentoses were also found. Comparison of figs. 1 and 2 certainly indicates that in the second half of pregnancy slight reductions are more likely to be due to lactose than to glucose. It therefore seems that, where the Benedict test is made as described above, slight reductions graded as green 1 may safely be considered as normal during pregnancy.

TABLE VII—NUMBER OF BREAST-FEEDERS AND NON-BREAST-FEEDERS PROVIDING POSTNATAL URINE SPECIMENS

Duration of puerperium	2 days	4 days	8 days	6 weeks
No. of breast-feeders providing urine specimens	109	156	156	110
No. of non-breast-feeders providing urine specimens ..	5*	9*	8*	47

* In all these patients lactation was being suppressed with stilbœstrol.

Mechanism of Production of Glycosuria and Lactosuria

There is abundant evidence that glycosuria during pregnancy is at least partly explained by a lowering of the renal threshold for glucose (Welz and Van Nest 1923, Höst 1925, Lawrence 1927, Williams and Wills 1928, Weiden 1948). Some workers maintain that a diminished glucose tolerance also plays a part (Höst 1925, Williams and Wills 1928), but more recently Weiden (1948) and Jackson (1952) have found that, with few exceptions, the blood-sugar curve in uncomplicated pregnancy does not rise above normal limits. Our finding that glycosuria was more common among patients attending the afternoon clinic is compatible with these facts; thus, it is probably a reasonable assumption that patients attending in the afternoon would have enjoyed a greater carbohydrate intake just before their visit than those attending the morning clinic. The more frequent excretion of glucose by patients in the older age-group might be due to glucose tolerance diminishing slightly with age; this has been demonstrated in males by Smith and Shock (1949).

Except during the puerperium, there is less certainty about the mechanism by which lactose comes to be excreted in the urine. There is good evidence that there is no renal threshold for lactose (Winter 1932, Brock and Hubbard 1935), and it has been established by amputation of the udder in goats that breast tissue is the only source of lactose during the puerperium (Porcher 1904). It follows that lactosuria must result either from synthesis of lactose in the mammary glands or from absorption of lactose from the gut without prior splitting into glucose and galactose. The occurrence of spontaneous lactosuria with equal frequency in male and female control patients suggests that in these patients the source of the sugar is the gut. The experiments of Watkins (1928) and Winter (1931) with oral administration of lactose suggest that lactosuria may arise in this way. Since lactosuria occurs much more often during pregnancy it is unlikely to be alimentary in origin at that time, unless one postulates either a diminished lactase activity or alternatively a greatly augmented milk intake. Pregnant women in this country are given a free pint of milk, which contains 26 g. of lactose, but this extra milk is unlikely to explain spontaneous lactosuria, since Watkins (1928) has shown that tolerance to oral lactose during pregnancy is two or three times greater than normal. On the other hand, the progressive development and secretory activity of the breasts during pregnancy could explain the frequent occurrence of lactosuria and its greater incidence in the later months. On balance a mammary origin seems more likely. Our finding that lactosuria occurred slightly more often in patients attending the afternoon clinic might indicate a diurnal variation in lactose synthesis. The finding that lactosuria occurs less often in multiparæ is interesting; it could be explained on the basis that their breasts, having previously undergone complete development, can more readily accommodate the small volume of secretion without the pressure rising within the alveoli, leading to reabsorption of lactose. Thus, Watkins (1928) postulated that lactosuria during lactation resulted from milk production exceeding milk removal. The fact that we often found lactosuria in those in whom lactation was being suppressed supports this hypothesis.

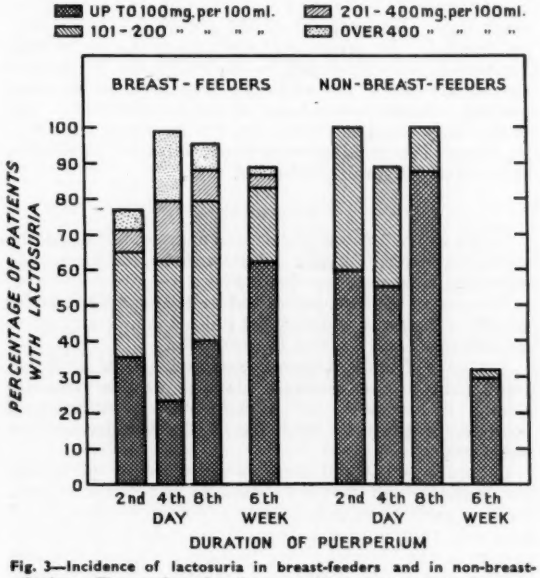

Fig. 3—Incidence of lactosuria in breast-feeders and in non-breast-feeders. The number of patients providing specimens is shown in table vii.

Summary

The excretion of sugars in the urine during pregnancy and the puerperium has been reinvestigated by paper partition chromatography. Results are presented of both qualitative Benedict tests and chromatographic analyses on single specimens of urine from 372 control patients and on 2373 antenatal and 657 postnatal specimens of urine from 245 pregnant women.

With a critical technique a very high incidence of Benedict reductions was found during pregnancy (72·9%) and after delivery (87·8%). Where this test is done carefully, reduction during pregnancy is often due to lactose.

Lactosuria occurs in male as well as non-pregnant female patients on normal diet. Lactose, usually traces, was detected in the urine of 9% of controls of either sex; this is probably alimentary in origin.

Lactosuria is common during pregnancy, occurring about twice as often as glycosuria. Lactose, usually in small amounts, was found at 51% of all antenatal attendances, being detected at some time in 94% of patients attending the clinic regularly. Glucose was found at 24% of antenatal attendances, but 33% of regular attenders never excreted detectable quantities of it.

Antenatal lactosuria increases in incidence as pregnancy advances, was found more often in the afternoon, and more commonly in primigravidæ.

Antenatal glycosuria was found more often in the afternoon, and more frequently in older patients.

The frequent excretion of considerable quantities of lactose during the puerperium is confirmed; and pregnancy glycosuria was found to disappear rapidly after delivery.

In pregnancy glycosuria is probably due to a low renal threshold for glucose, and lactosuria to escape of lactose formed in the mammary glands.

Glucuronate was found very often in the antenatal specimens of urine, and traces of pentoses and fructose were found in a few cases.

A new spray reagent for showing up sugars on paper chromatograms is described.

We thank Prof. W. C. W. Nixon for permitting us to obtain urine from the obstetric patients and for giving us access to

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IMPALEMENT OF THE RECTUM

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INJURY of the rectum is relatively uncommon in civilian life, and the published reports are of small series of individual cases and collective reviews. These deal mainly with impalement injuries caused by the patient falling or sitting on an upright article, the configuration of the thighs and buttocks causing the instrument in many cases to enter the anus.

Van Hook (1896), reviewing the published cases, pointed out that the injury occurred in males in 75% of cases, falling on to a pitch-fork being the common mode of injury. Habhegger (1912) reported a mortality of 26·8% in 179 cases, rising to 78·5% when the peritoneal cavity and abdominal viscera were involved. This indicates that the lesion is potentially serious, but the use of antibiotics has greatly improved the prognosis.

Types of Injury

There are two main varieties: in the first the offending object enters the anal canal directly; in the second it enters the rectum after passing through the buttock or the perineum. When it enters the anal canal directly, the laceration of the rectum is commonly situated on the anterior wall 2 or 3 in. from the anus. The extent of the injury naturally depends on the force of penetration. It may be a superficial laceration of the rectal mucosa, or it may penetrate the bowel wall and enter the pelvic cellular tissue or reach the peritoneal cavity or the bladder. There may be no outward evidence of the injury on examination of the anal region; and this may cause some delay in the diagnosis of a rectal wound.

The injury of the buttock opens up the ischiorectal fossa, a fat-containing space particularly liable to infection. An abscess forms in the loose pararectal tissues quickly and may be overlooked. In this situation rapid resolution is unusual and may lead to the formation of chronic abscesses or to fistulæ. Seybold et al. (1944), reporting seven cases seen in the Mayo Clinic between 1910 and 1939, point out that only one patient was in hospital for less than thirty days, the remainder being detained longer because of infection. The prevention of such infection should be possible with early diagnosis and adequate treatment.

Injury of the perineum may include laceration of the urethra; here again early treatment will avoid serious complications and later development of a stricture.

Diagnosis

Examination of the patients in the more serious injuries reveals usually only a slight degree of shock, though they may be in considerable pain.

Local examination of buttock and perineum may show slight bruising of the anus if the article has entered the anal canal. Lacerations of the buttock will be evident and should be inspected in a good light; and an attempt should be made to determine the direction of entry of the offending article. Digital examination of the rectum may not always reveal a wound of the rectal wall; the only indication of this may be blood on the examining finger.

Abdominal examination in cases of peritoneal penetration will show lower abdominal tenderness and muscle guarding in the early stages. Later, well-marked rigidity will develop and the bowel sounds will usually be absent.

The *urine* should be examined at the earliest opportunity, the patient being catheterised if unable to pass urine normally. The presence of blood indicates damage to the bladder; cystoscopy would then be indicated to determine the site and extent of the damage.

Proctoscopy is essential and will reveal the laceration in most cases. The mild case will only show bruising of the rectal wall; penetration into the peritoneal cavity cannot be diagnosed with certainty by this examination. Sigmoidoscopy with the introduction of air is contra-indicated.

Radiography.—The abdomen should be X-rayed in every case. Involvement of the pararectal tissues may be shown by the presence of air outside the rectal wall. Peritoneal penetration will be shown by the presence of a small amount of air under the diaphragm in the erect position. Dilatation of loops of the small intestine, due to the early onset of peritonitis, will be present in about six hours. Free fluid between bowel loops will be evident in the later stages of peritonitis.

Treatment

Shock will be treated in the usual manner, but morphine should be withheld until a definite decision has been made regarding peritoneal involvement.

Wounds of the buttock should be fully explored under general anæsthesia and surgical toilet done. The wounds are left open and allowed to granulate.

A wound of the perineum is explored, special attention being paid to the urethra. Damage to this structure should be repaired by suture over a catheter if possible. Suprapubic drainage of the bladder is then indicated.

Laparotomy is indicated in all cases of peritoneal involvement, and should be done in any doubtful case. Even in early cases well-marked hyperæmia of the bowel wall and thin purulent exudate are found. With the patient in the Trendelenburg position the small intestine is lifted out of the pelvis and examined for lacerations. The wound in the rectum is next exposed and sutured

in layers. Drainage of the pelvis, through the lower end of the incision, is necessary. James (1940) makes no attempt to suture the rectal wall but covers the laceration with a peritoneal flap. It is considered safer to suture the rectum if possible, to prevent continued infection of the pararectal tissues. The bladder is next examined; if a wound is found it should be repaired with two layers of sutures and suprapubic drainage should be instituted. The remainder of the bowel is next inspected for tears. Attention should be given to the mesentery for any vascular injuries; a slowly developing hæmatoma should be dealt with because it may later devitalise an area of bowel. James (1940) reports a complete tear of the mesentery of the sigmoid colon, but this did not require resection of the bowel. Laceration of the duodenum has been reported on one occasion. The presence of retained foreign bodies should be investigated.

Colostomy is indicated in the following circumstances: (1) a large laceration of the rectum which is difficult to close; (2) a wound involving the rectum and buttock, in an endeavour to lessen the infection in this region; and (3) severe damage involving rectum and bladder. The colostomy can be closed when the rectal and buttock wounds are healed. This takes from three to six weeks according to the severity of the injury.

The patient should receive antitetanic and anti-gas-gangrene serum. Phthalylsulphathiazole 10 g. daily is given by the mouth. Penicillin or aureomycin in adequate doses is also given. If peritonitis is well developed, intravenous fluid should be given and gastric suction started early to combat paralytic ileus.

Case-reports

Case 1.—A schoolboy, aged 14, was admitted to Bridgend General Hospital at 12.30 P.M. on May 2, 1950. An hour before admission, while jumping over cricket stumps in the playing-field, he fell, and a stump entered his anus through his trousers. He complained of severe spasmodic suprapubic pain and nausea. He passed a bloodstained stool but could not pass urine.

Examination showed pallor, slight cyanosis, pulse-rate 108, and temperature 98·8°F. Generalised abdominal rigidity was present, with much tenderness in the lower quadrants. The bladder was not palpable. The anus had a small abrasion anteriorly, with some blood coming from the rectum.

At operation, three hours after injury, proctoscopy showed a perforating wound 1 in. long on the anterior wall of the rectum and about 2 in. from the anus. The rectum was cleaned out and a tube inserted. Cystoscopy showed a normal bladder. Laparotomy revealed early peritonitis with a retroperitoneal hæmatoma on the left side of the pelvis. There was a wound 1 in. long in the rectum just above the peritoneal reflexion. This was sutured and covered with peritoneum. A small laceration of the pelvic mesocolon was found and repaired. A drainage tube was inserted in the pelvis. A left inguinal loop colostomy was done.

Progress.—On May 4 a mild paralytic ileus developed and was treated with intravenous fluids and by gastric suction. Proctoscopy on May 22 showed that the laceration had not healed, but complete healing had taken place by June 15, when the colostomy was closed. The boy was discharged home on June 29, when bowel action was normal.

Case 2.—A man, aged 29, was admitted to Bridgend General Hospital at 10.30 A.M. on June 2, 1950, after falling 20 ft. from a ladder on to a wooden fence. He was complaining of pain in the buttocks. His general condition was fair, with only slight shock.

Examination revealed an irregular laceration 3 in. long on the left buttock about 3 in. from the anus. Rectal examination revealed a laceration of the lateral wall of the rectum about 1½ in. from the anus. Abdominal examination showed no rigidity or tenderness. Catheterisation produced 10 oz. of normal urine. Four hours later the patient complained of lower abdominal pain, and examination showed lower abdominal tenderness and rigidity.

At operation, six hours after the injury, the buttock wound was explored and excised. Proctoscopy confirmed the laceration previously described, and no damage to the sphincter muscles was seen; no further lesion was found in the rectum. Laparotomy revealed pelvic peritonitis with bloodstained purulent exudate. A small laceration in the rectum found above the peritoneal reflexion was sutured; this laceration had not been found on proctoscopy. Slight bruising of the pelvic colon and a small laceration of its mesentery were found. No injury to the bladder was found. A left inguinal loop colostomy was done, and the pelvis was drained.

Progress.—The patient received antitetanic anti-gas-gangrene serum, penicillin, and sulphadiazine. He developed mild paralytic ileus. On July 18 proctoscopy showed the buttock wound, which was not healed, to be still communicating with the rectum. This was healed by Aug. 24, and the colostomy was closed on Aug. 28. The patient was discharged home on Sept. 12, all wounds having healed. He was re-examined in six weeks and again two years later, when he was symptom-free. There was a moderate amount of scarring in the buttock, and slight scarring was palpable in the rectum.

Case 3.—A boy, aged 6 years, was admitted to the Cardiff Royal Infirmary on Aug. 31, 1952, after having fallen backwards on to a bamboo cane, which pierced his trousers and entered his anus. He vomited two hours later and complained of central abdominal pain. His bowels had acted twice before admission, and the stool contained blood. He passed urine normally.

On examination his general condition was good, slight abdominal tenderness was present, and bowel sounds were normal. Rectal examination revealed no laceration, no blood being present on the examining finger. Slight bruising of the anal margin was present. Radiography of the abdomen revealed no abnormality.

Progress.—The boy had a bowel action next day, when a little blood was present. The abdominal pain and tenderness had gone. On Sept. 2 a small lump was palpable in the anterior wall of the rectum. Proctoscopy on Sept. 5 revealed a ½-in. laceration of the anterior wall of the rectum 2 in. from the anus, with a slough in the base. Bimanual palpation discovered an inflammatory mass about 1 in. in diameter anterior to the rectum. The patient was treated with chloramphenicol and sulphathalidine. Proctoscopy on Sept. 17 showed that the laceration had now healed and the mass had disappeared. He was discharged home on the following day. Follow-up examinations have shown the healing to be complete.

Discussion

The main lesson to be learnt from these cases is that early treatment is essential in limiting infection. Full examination and special investigations are necessary to determine the exact nature of the injury. In case 2, where no abdominal tenderness was found on first examination, radiography would probably have shown intraperitoneal gas and enabled the diagnosis of peritoneal penetration to have been made earlier. In case 3 there did not appear to have been any peritoneal damage, though the patient complained of abdominal pain.

It is essential in these cases to know whether the rectum is perforated and, if so, whether the peritoneum is involved.

Colostomy is discussed by most workers, and many do not advocate it strongly; but it seems advisable in most cases, even though it prolongs the period spent in hospital and entails a further operation for its closure (Powers and O'Meara 1939, Siler and Bebb 1950). Even with modern chemotherapy it was considered safer to do colostomy in two of these cases. In the second case, with perforation of the rectum through the buttock, it was essential to prevent spread of sepsis and later formation of fistulæ.

I am indebted to Dr. Jeffery Jones, Mr. A. C. Lysaght, and Prof. A. G. Watkins for permission to publish these cases, and to Mr. D. J. Harries for help in the preparation of this report.

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EXERCISE TESTS DURING TREATMENT OF HYPERTENSION WITH HEXAMETHONIUM

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IN the course of treatment of hypertension with hexamethonium I have observed that a few patients have appreciable subjective symptoms despite the fact that they have been given an apparently adequate dosage leading to a proper reduction of their blood-pressure in the upright position. Such patients feel well at rest and when they walk about quietly, but feel dizzy on slight exertion and have to stand still, sit down, or even lie down.

One explanation might be that, in these patients, hexamethonium did not prevent a considerable rise in blood-pressure on exertion; but it was striking that the symptoms might also appear in patients who had not been troubled, before treatment, by pronounced symptoms of hypertension caused by exercise.

It therefore occurred to me that the symptoms determined by exercise in such patients might be due to a fall in the blood-pressure under treatment with hexamethonium during exercise, instead of the usual rise.

Hitherto only a few reports have been published on blood-pressure during exercise under treatment with hexamethonium. Hood et al. (1952) state that under these conditions there is considerably less rise in the blood-pressure than usual; but so far as I know a fall in the blood-pressure determined by exercise in the course of treatment with hexamethonium has not yet been reported.

Investigation

I investigated the effects of exercise on patients treated with hexamethonium. The procedure followed in these investigations, which were made with Krogh's bicycle ergometer, and the results of the investigations will be described in detail elsewhere. Here mention will only be made of the importance of the exercise tests in finding the proper dosage of hexamethonium.

The blood-pressure is measured with the patient erect, and a combined oral and hypodermic administration of hexamethonium, or of hexamethonium in polyvinylpyrrolidone with the longer-lasting effect, has been used (Smirk 1952, Rønnov-Jessen and Bech 1953, Rønnov-Jessen 1953). Exercise tests will be required only in the cases in which the adjustment of the patient to the dose is beset with the difficulties mentioned above.

Illustrative Case-records

Case 1.—A fisherman, aged 57, had an attack of violent hypertensive encephalopathy, since when he had had increasing dyspnœa on exertion for a couple of months. For this reason he could walk only about 50 yards at a time when admitted.

Treatment.—Since his condition remained unchanged after a fortnight's stay in hospital and he was still hypertensive, treatment with hexamethonium was begun.

Progress.—During the next few months his condition improved considerably, and he could ride a bicycle 3–6 miles without being tired. Throughout the day his systolic blood-pressure was 110–150 mm. Hg in the upright posture, and his general health was excellent. After six months' treatment he began to complain of dizziness and oppression in the precordial area, even on moderate exertion. These symptoms were most pronounced during the first few hours following the injections. The blood-pressure in the upright posture had remained unchanged and satisfactory.

Exercise tests with Krogh's bicycle ergometer (fig. 1) showed that, with a blood-pressure of about 145/110 mm. Hg with the patient sitting (corresponding to 125/95 mm. Hg in the upright posture), the blood-pressure fell considerably and a sense of epigastric oppression developed when the exercise amounted to 360 kilogramme-metres (kg.m.) per minute for 2 minutes. With an intensity of 540 kg.m. per minute for $1^1/_2$ minutes the patient became pale and felt unwell and dizzy, with precordial oppression and a fall in the blood-pressure to 110/70 mm. Hg. With a blood-pressure of 160/110 mm. Hg with the patient sitting (corresponding to about 140/100 mm. Hg in the upright posture) the fall was much lower, and the patient had no complaints. An attempt was therefore made to maintain a systolic blood-pressure of 140–160 mm. Hg in the upright posture. During the eight weeks since then the patient has been feeling better and has been much less troubled by his condition.

Case 2.—A farmer, aged 55, with severe hypertension, albuminuria, and pronounced retinal changes, had been for a few months completely unfit for work, with severe attacks of hypertensive encephalopathy, dyspnœa on exertion, and attacks of stenocardia.

Treatment and Progress.—Hexamethonium therapy produced considerable subjective improvement and got rid of the headache and dizziness, and the patient was feeling well with a blood-pressure of 150/100–200/120 mm. Hg in the upright posture compared to the former pressure of about 230/150 mm. Hg. When he was allowed to go for walks outside the precincts of the hospital, however, he began to complain of dizziness and general malaise when he walked rather quickly, especially during the first few hours after an injection.

Exercise tests (fig. 2) showed that he could tolerate an intensity of exercise of 540 kg.m. per minute for 2 minutes + 1 minute after a minute's rest without being troubled and with a resulting moderate fall in the blood-pressure when the original pressure was about 200/120 mm. Hg, but he nearly collapsed doing the same amount of exercise when the original blood-pressure was about 180/105 mm. Hg. In this patient, who had the same blood-pressure in the sitting and the upright postures, we therefore tried to keep the systolic blood-pressure 190–200 mm. Hg. During the twelve weeks since then the patient has been feeling well, though he is still somewhat dizzy on too great exertion.

Discussion

The fall in the blood-pressure on exertion in these patients is presumably due to the effect of hexamethonium

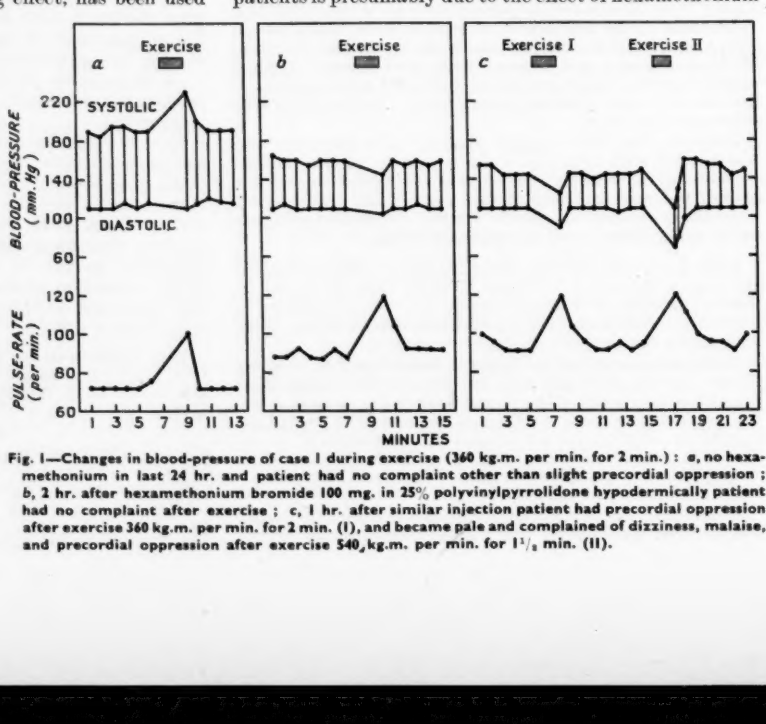

Fig. 1.—Changes in blood-pressure of case 1 during exercise (360 kg.m. per min. for 2 min.): *a*, no hexamethonium in last 24 hr. and patient had no complaint other than slight precordial oppression; *b*, 2 hr. after hexamethonium bromide 100 mg. in 25% polyvinylpyrrolidone hypodermically patient had no complaint after exercise; *c*, 1 hr. after similar injection patient had precordial oppression after exercise 360 kg.m. per min. for 2 min. (I), and became pale and complained of dizziness, malaise, and precordial oppression after exercise 540 kg.m. per min. for $1^1/_2$ min. (II).

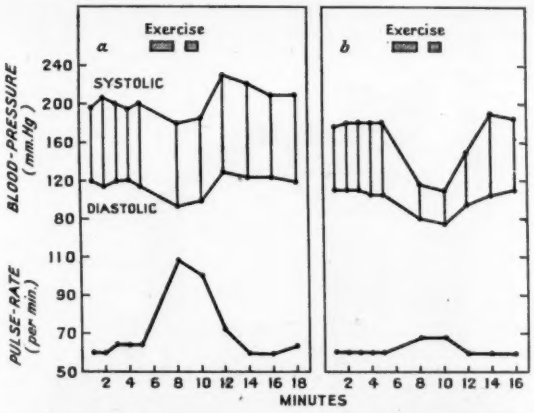

Fig. 2—Changes in blood-pressure of case 2 during exercise (540 kg.m. per min. for 2 min. + 1 min. after a minute's rest): *a*, 7 hr. after hypodermic injection of hexamethonium bromide 230 mg. in 25% polyvinylpyrrolidone patient had no complaint apart from fatigue in legs after exercise; *b*, 2 hr. after similar injection patient became pale, felt dizzy and unwell, and nearly collapsed.

on the sympathetic, preventing the depletion of the blood depots in the course of exercise when the dose administered is too large. This means, in other words, that there is a failure of the inflow into the right ventricle. It appears in case 2 (fig. 2*b*) that there was only a slight increase in the pulse-rate during exercise when the effect of hexamethonium was vigorous, whereas there was a normal increase in the pulse-rate when the effect of hexamethonium was less pronounced (fig. 2*a*). This is presumably due to the fact that in case 2 hexamethonium produced a very effective block of the sympathetic nerves to the heart. Generally a less pronounced blocking effect on the sympathetic nerves to the heart is seen.

The importance of these observations is as follows:

(1) When the blood-pressure in the course of treatment with hexamethonium falls below a certain level, some patients show, during exercise, an additional fall in the blood-pressure, with resulting hypotensive symptoms and presumably a risk of thrombosis in the brain and the heart.

(2) Patients like case 2 can presumably be protected to some degree against stress on the circulation during exercise, even though the reduction of the blood-pressure obtained at rest is rather slight. There can hardly be any doubt that some cases in which treatment has been abandoned have been of the same type as case 2. These patients had such severe complaints after a fairly slight reduction of blood-pressure that it was wrongly believed that treatment would be of no use.

Conclusion

The exercise tests have shown that some patients whose blood-pressure had fallen to a reasonable level during treatment with hexamethonium had an additional fall of blood-pressure during exercise, with resulting hypotensive symptoms. Such patients should have their blood-pressure adjusted, so far as possible, at a suitable higher level, so that it fluctuates only slightly during exercise.

In the treatment of hypertension with hexamethonium generally the ideal would be to adjust the blood-pressure so that it shows only slight fluctuations during exercise. There are presumably only a few patients in whom this is incompatible with a more considerable reduction of the blood-pressure towards the normal in the upright posture.

Summary

In most hypertensives the reduction of the blood-pressure towards the normal in the upright posture is compatible with only small fluctuations of blood-pressure during exercise, but in some patients treated with hexamethonium the blood-pressure falls considerably during exercise, with resulting hypotensive symptoms.

By means of exercise tests these patients can have their blood-pressure adjusted to a level which allows them to exercise without any appreciable fall in the blood-pressure.

A few patients treated with hexamethonium develop symptoms of hypotension during exercise even though the blood-pressure in the upright posture has been only comparatively slightly reduced. If this is recognised, and a somewhat slighter reduction than usual is therefore attempted, these patients may nevertheless be beneficially treated with hexamethonium.

Messrs. May & Baker Ltd. supplied the hexamethonium compounds.

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RESPIRATION PUMP FOR POLIOMYELITIS

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THE use of positive-pressure artificial respiration through a cuffed tracheotomy tube has been advocated by Lassen (1953) for some cases of poliomyelitis. The indications for using this method are not yet fully determined, but it seems desirable that poliomyelitis units should be prepared to establish this type of artificial respiration when other methods prove inadequate.

The machines described here have been designed to supply the air and/or oxygen required at any desired pressure, rate, and volume, and have both been shown to operate satisfactorily for 4 weeks in a case of poliomyelitis in which there was extreme spinal and bulbar paralysis; after this period natural respiration returned.

It should, of course, be emphasised that, as Lassen pointed out, very careful supervision by anæsthetists is required for these cases, whatever system may be used for delivering the necessary air or oxygen.

The two pumps described here have these factors in common:

(1) The pressure under which air is delivered to the patient is obtained by weights pressing downwards on the top of the bellows or piston so that no accidental circumstance can increase the pressure beyond the maximum attributable to the weight selected.

(2) The pressure can be varied by varying the weight.

(3) The volume of air delivered at each stroke can be adjusted by controlling the length of travel of the piston or bellows top.

(4) The respiration rate can be adjusted by altering the speed of the driving or regulating motors.

Pump A (fig. 1) is driven by an electric motor, pump B (fig. 2) by vacuum. The suction system provided in the wards and theatres of this hospital provides a negative pressure of 10–20 in. Hg, and was found to be a convenient and satisfactory source of vacuum to operate pump B.

PUMP A

The motive power and speed regulation are provided by a universal motor with a built-in rheostat and reduction gearing giving an output of 60–200 r.p.m. The rotation is transmitted by a pinion to a large gear-wheel, the speed reduction being about 1 : 8. Thus the

maximum respiration-rate is 25 per min.; the minimum usable speed is about 14 per min. The air movement is obtained by the 'Oxford' inflating bellows (Mackintosh 1953). The large gear rotates about a horizontal axis, and about $^3/_4$ in. from its face is a vertical slideway, the centre of the gear being in the same plane as the centre line of the slideway. A slipper mounted on this is provided at its upper end with a projecting fork which engages with the handle of the bellows. The slipper carries near its lower edge on one side a horizontal fin projecting towards the gear. On the gear is a rubber-tyred roller mounted with the eccentricity needed to give the desired length of movement to the slipper. As the gear rotates, the roller, when it leaves its lowest position and starts moving upwards and to the side, passes under the horizontal fin of the slipper and, as its movement is continued, carries the slipper upwards with it until it has moved so far to the centre line again as to disengage itself from the fin.

In the original form of the pump the slipper was then free to move downwards by gravity driving the top of the bellows with it. This was found to give too long a time interval between the end of inspiration and the beginning of expiration, because the expiratory valve at the patient's end of the air-delivery tube did not open until the slipper had started to rise again. This difficulty has been got over by holding the slipper at its highest position with a spring-loaded catch until the catch is thrown out of action by the roller in its downward path. The weight of the slipper is enough to give an air-pressure of about 14 cm. H_2O. Additional weights placed on the top of the projecting fork can bring it up to more than 20 cm. The volume of air delivered is regulated by a movable stop which limits the downward travel of the slipper.

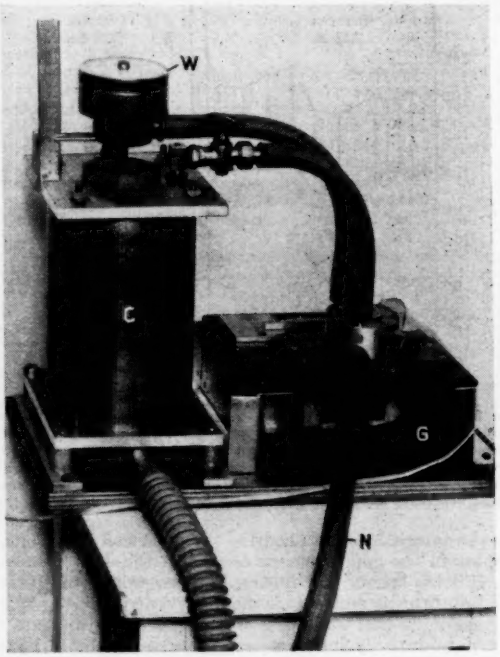

Fig. 2—Pump B: W, weight-operated piston in cylinder (C); N, delivery tube from hospital suction system; G, gramophone motor operating valves.

PUMP B

The body of the pump consists of a brass cylinder clamped between upper and lower end-plates. The lower plate carries the delivery nozzle and the inlet tube and valve. There is a side nozzle on the inlet tube with a stopcock for introducing oxygen when required.

The cylinder contains a heavy brass piston carrying the conventional leather cup facing downwards. It is guided by a rod passing through a bearing in the upper plate. Above the bearing the rod passes through a collar, to which it is fixed by grub-screws. This collar limits the downward motion of the piston and serves as a rest on which additional weights can be placed. The movement of the piston is regulated by a rotating valve driven by an electric gramophone motor. Its speed can be varied between 14 and 24 r.p.m. by using the centrifugal governor of the motor. The valve rotates in a bronze body with two pairs of nozzles on the outside opening from internal ports in the bore (A1 and A2, and B1 and B2). The ports of each pair are situated one immediately above the other. The valve has a recess cut in it, which when it comes opposite to a pair of ports connects them together. One of each pair of ports (A1 and B1) is connected by its associated nozzle and a length of tubing to the upper part of the cylinder, and the two remaining ports (A2 and B2) are connected respectively to the suction mechanism and the free air. Thus, when the recess is opposite A1 and A2, air is sucked from the upper part of the cylinder and the piston rises till it reaches its limit, which is set by an adjustable stop. A gas tap regulates the speed at which the piston can rise. The recess occupies about 120° of the circumference of the valve, and a short time after it has passed over A1 and A2 it starts to connect B1 and B2. When this happens, the pressure in the upper part of the cylinder returns to atmospheric and the piston consequently falls, expelling air from the delivery nozzle. Its rate of fall depends on the resistance met with by the expelled air and its weight. It sometimes happens, both with pump B and with pump A, that the resistance is too great to allow the piston or bellows top to reach its lower limit in the time available;

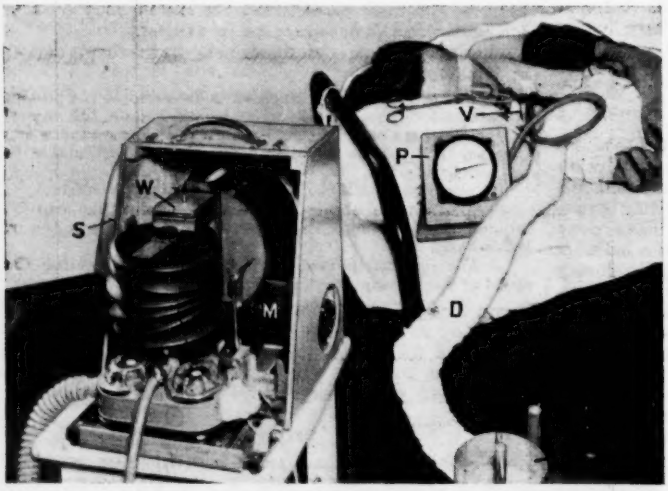

Fig. 1—Pump A operating 'Oxford' inflating bellows during gravity-operated inflation through tracheotomy tube: W, operating weight; M, electric motor; H, hummidifier; P, pressure gauge; D, lagged delivery tubing; V, expiratory flutter valve (Stott); S, adjustable stop for volume control.

this may be taken as a danger signal. The exact position of the piston and its actual range of motion are indicated by a pointer attached to its rod, which moves up and down a vertical scale rising from the upper plate, whose divisions represent amounts of 100 ml.

A good method of controlling delivery of the appropriate proportion of oxygen and air by either of these pumps is provided by attaching an anæsthetic bag to the air inlet and feeding into this bag the desired mixture of gases through an entrainment device.

These initial designs, though capable of being improved, provide a safe form of apparatus which is adjustable not only for rate but also for pressure and volume.

The pumps are manufactured with improvements by Messrs. H. G. East & Co., Longworth Road, Oxford, and are named "Radcliffe Respiration Pumps" A and B. The expiration valve used was the flutter valve designed by Dr. F. D. Stott and manufactured by Messrs. Owen Mumford, Green Place, Abingdon Road, Oxford. With this in use the disc of the expiratory valve on the inflating bellows must be removed. We are indebted especially to Dr. A. Crampton-Smith and Dr. J. M. K. Spalding for supervising the use of these machines.

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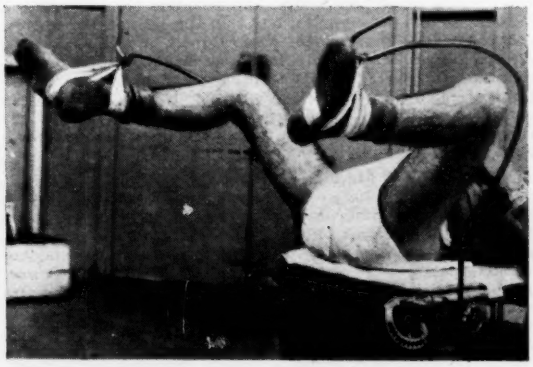
New Inventions

LEG SUPPORTS FOR CYSTOSCOPY AND PERURETHRAL RESECTION

IN cystoscopy the position of the patient's legs is a matter of some importance; it affects both the comfort of the patient and the convenience of the surgeon. It matters even more in perurethral resection and other endoscopic operations. The leg supports should hold the hips flexed not more acutely than a right angle, and should not come between the surgeon's head and the patient's thighs, thus allowing the fullest range of



movement of the endoscope, as in excavating the lateral lobes of the prostate or in catheterising an awkwardly situated ureteric orifice. The perineum should be flush with the end of the table, and it is an advantage to have the feet high enough to be out of the way. A proper cystoscopy table may meet all these requirements, but it is not always convenient to use it in a theatre which is not devoted entirely to urological work.

The supports illustrated here hold the legs in the required position. They are a variant of the ordinary "lithotomy" supports and can be fitted to any standard operation table. They were made by the engineer's staff of the hospital and are of stainless steel. The iron prototypes were in all important respects satisfactory but did not look smart enough to win general approval in the theatre.

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Reviews of Books

The Spinal Cord

A Ciba Foundation Symposium. Editors: J. L. MALCOLM, M.B., B.MED.SC.; J. A. B. GRAY, M.A., M.B. Editor for the Ciba Foundation: G. E. W. WOSTENHOLME, O.B.E., M.A., M.B., assisted by JESSIE S. FREEMAN, M.B., D.P.H. London: J. & A. Churchill. 1953. Pp. 300. 30*s*.

IN introducing the discussions of which this publication is the printed record, Prof. G. L. Brown indicated that the symposium had been limited to the spinal cord in order to avoid the danger that the members might find with them "people whose language we could not understand. We felt that if we stopped at the medulla oblongata everybody would understand everybody else." From this arbitrarily narrowed territory there is but a single geographical departure—a contribution by Lorente de No on the conduction of impulses on the neurones of the oculomotor nucleus. It must not be imagined, however, that this volume is a simple account of the present state of knowledge of the function and structure of the spinal cord, a Rattiganesque "Reflexes without Tears," for to this anatomically limited field have been applied all the special devices of the electrical, pharmacological, and anatomical worlds. Two of the early sections deal with the anatomical organisation of motor cells in the spinal cord of sheep and cats, but the motif in most of the contributions is biochemical or electrical. The contributors are internationally famous in neurophysiology: Eccles, Lorente de No, Laporte, Skoglund, Matthews, Adrian, Liddell, Whitteridge, and Young—to mention only a few. In spite of the complexity of the work reported, the information contained in the articles and the points raised in the subsequent discussions are of great interest not only to neurophysiologists but to clinical researchers and clinicians in neurology generally. The articles dealing with the effects of various drugs on monosynaptic and polysynaptic reflexes are particularly interesting in relation to recent attempts to relieve clinical spasticity. The printing is clear and easily readable, and the diagrams well set out and understandable—respects in which this record of a symposium differs from some others.

Fifty Years of Medicine

Lord HORDER, G.C.V.O., M.D., F.R.C.P. London: Duckworth. 1953. Pp. 70. 5*s*.

THIS book is an expanded version of the three Harben lectures delivered in December, 1952, at the Royal Institute of Public Health and Hygiene. The first lecture, entitled The Birth of Scientific Medicine, describes the progress made by medicine during the last half-century. The second, Medicine Enlarges its Boundaries, discusses, among other things, nutrition, physical medicine, industrial medicine, and nursing. The third, on The Present and the Future, contains a full-blooded attack on the National Health Service Act and the Minister responsible, and tackles the problems of noise, smoke, cremation, and hygiene in time of war—problems on which the author has himself done a great deal to arouse and guide professional and public opinion. Whether one agrees or disagrees, he is always interesting; and frustrated medical men will get full value from the seven pages dealing with medicine and the State.

Synovial Fluid Changes in Joint Disease

MARIAN W. ROPES, M.D., associate physician; WALTER BAUER, M.D., chief of medical services, Massachusetts General Hospital, Boston. Cambridge, Mass.: Harvard University Press. London: Oxford University Press. 1953. Pp. 150. 25*s*.

THIS is a first-class piece of work. The publisher's note calls it "a distinguished definitive study of joint fluid in health and disease." This is no exaggeration; it is a painstaking evaluation of the results of some 1500 specimens of synovial fluid in various diseases and is presented with obvious fairness. The authors have had the same difficulty as other workers in this field in obtaining normal synovial fluid to act as a basis for comparison; but this is really an interim report on their studies, which extend back over the last twenty years, and there is admittedly still a great deal to discover.

From their already massive data they have been able to divide joint disease into two major groups —a "traumatic" group (which includes degenerative arthritis, osteochondritis dissecans, and Charcot's joints) and an "infectious" group (which includes rheumatoid arthritis and tuberculosis). By examination of the synovial fluid, these two groups can be fairly reliably differentiated. With the knowledge they put at our disposal the diagnosis of the "observation knee" and other obscure effusions into joints is going to be facilitated. Within the groups, the findings in each disease are admittedly not so helpful in diagnosis, though in many instances they can be strongly suggestive.

This book, which is one for the specialist, expresses the results of a major piece of planned research. There is no padding: but so far as is possible with such concentrated material the facts are presented in a readable way.

Diseases of the Ear, Nose and Throat

A Textbook of Clinical and Laboratory Procedures. GEORGES PORTMANN, M.D., professor of otorhinolaryngology, University of Bordeaux. Baltimore: Williams & Wilkins. London: Baillière, Tindall, & Cox. 1951. Pp. 728. £7 10*s.*

Professor Portmann is a prolific author of books and contributor to journals. The quantity of his published work is astonishing, but what is even more astonishing is its quality and diversity. All these attributes are illustrated in this book, which appeared two years ago. It comes as a surprise to learn that so many investigations of such different kinds are possible; but it would test the energies even of the author to use all of them, and most readers would welcome more critical guidance in their selection. As in all French textbooks the anatomical sections are particularly good; but the ear, nose, and throat specialist in this country rarely attempts also to be a radiologist, and the long descriptions with numerous illustrations of radiographic technique seem out of place. Nevertheless, the better understanding of the methods employed, which a study of these descriptions will inevitably induce, must lead to an improvement in interpretation. Tests of function of the cochlea and vestibular apparatus are exceptionally well described and illustrated, but again there is no reliable guidance on which tests to select. The American translators have adequately conveyed the fluent and emphatic manner of the original.

Functional and Surgical Anatomy of the Hand

EMANUEL B. KAPLAN, M.D., F.A.C.S., assistant professor of anatomy, Columbia University, New York. Philadelphia and London: J. B. Lippincott. 1953. Pp. 288. 80*s.*

THIS scholarly work, written by a man who is both a practical anatomist and a practising orthopædic surgeon, is not intended to be encyclopædic. Nevertheless the lymphatic system is the only aspect of the subject which is treated really briefly. The illustrations—especially the diagrams demonstrating the action of the various muscles in movements of the fingers—are particularly good. Much of the work is original, and in consequence the description of the mid-palmar fascia and the various septa attached to it differs from accepted teaching in several respects, being of special interest in connection with Dupuytren's contracture.

A few tables might have been helpful, particularly in the listing of possible variations. The wording is not always clear, and there are some minor errors—such as reference to the phalanx when the metacarpal is meant, and vice versa. The index is good, and the value of the carefully chosen bibliography is greatly enhanced by the brief notes which the author has added under many of the more important listed works, calling attention to the special significance of each.

The book can be highly commended to all interested in the subject.

Long-term Diabetes

KNUD LUNDBÆK, M.D., Copenhagen, lecturer in internal medicine, Aarhus University. Copenhagen: Ejnar Munksgaard. 1953. Pp. 197. Cr. 32.

THIS book is described on the title page as giving the clinical picture of diabetes mellitus of 15–25 years' duration, with a follow-up of a regional series of cases. All of the 165 living patients in the series were followed up, and information was obtained on the 69 who had died by the time the series had been collected. The picture of the incidence of complications and their correlations may therefore be considered reliable for this part of Denmark, even though some of the information had to be obtained retrospectively. A number of interesting points emerge. Thus two-thirds of the diabetics aged 60–70 years had heart-disease, and diabetic retinopathy was present in 77%. In spite of this, only 3% of the series were disabled by poor eyesight, and the incidence of retinopathy did not increase after 15 years' duration of diabetes. The author also comes to the surprising conclusion that there is nothing to suggest that cataract is a long-term diabetic manifestation. In discussing the controversial question of the relation of diabetic control to the incidence of complications, he feels safe in concluding only that retinopathy was less common in those with good control; but the range of control in the series does not appear to have been very extensive or easy to decide. The monograph is valuable not only for the detailed information it contains but for the review of published work.

Pitkin's Conduction Anesthesia (2nd ed. Philadelphia and London: J. B. Lippincott. 1953. Pp. 1005. £9).—The American surgeon George Pitkin was a pioneer of local and block anæsthesia during the first part of this century, when the results of general anæsthesia were harder on the patient than those of the surgery itself. Conduction anæsthesia was his hobby, and he spent a great part of his life compiling notes and having illustrations made of suitable techniques. He died in 1943, three years before the first edition of this volume—which is based in part on his original work—was published, and one year after the first paper was written on the use of curare in clinical anæsthesia. The advent of the muscle relaxants has revolutionised general anæsthesia to such an extent that the need for local or block methods has steadily diminished. Good general anæsthesia is now less exacting, and is usually followed by fewer complications, than are some forms of purely local anæsthesia. But there is a field of application for local techniques in diagnosis and therapeutics.

This book is the standard work of reference for all types of local anæsthesia. It is encyclopædic, containing detailed anatomy, pharmacology of drugs, full and liberally illustrated descriptions of all techniques, and chapters on refrigeration anæsthesia and on complications. In this edition the editors (Dr. James L. Southworth, Prof. Robert A. Hingson, and Dr. Winifred M. Pitkin) have successfully revised and rearranged parts of the text to bring them up to date in the light of recent knowledge. Many new illustrations, and a considerable amount of information concerning the use of continuous extradural and segmental spinal anæsthesia, have been added.

A Textbook of Medical Psychology (London: Hogarth. 1952. Pp. 352. 30*s.*).—The tenth edition of Prof. Ernst Kretschmer's well-known text (reviewed in THE LANCET, 1951, i, 894) appeared in 1950, with additions based on the physiological research of W. R. Hess, and an expansion of the section dealing with psychotherapy. Dr. E. B. Strauss has again rendered a service by providing a faithful translation, which is, on the whole, clearer and more readable than the original. The longer sentences are broken up, the abstract nouns are made more concrete, and it is only rarely that cloudy or compound terms, so easily accepted in German, prove too much for him and he either invents a neologism such as "morphopoiesis," or takes refuge in literal translation. Professor Kretschmer's disregard of work published in languages other than German does not lessen the usefulness of this book as a handy guide to large areas of German psychiatry, now rather regrettably neglected outside Germany.

Guide to Human Parasitology for Medical Practitioners (5th ed. London: H. K. Lewis. 1953. Pp. 228. 25*s.*).—Blacklock and Southwell's well-known *Guide* has maintained its popularity since the appearance of the fourth edition in 1940. Now it has been brought up to date by Prof. T. H. Davey, and large sections of it, notably those on malaria, have been rewritten in a clear, concise, and accurate manner. The three new coloured plates are all good, especially the one which depicts blood parasites in thick film preparations, and draws attention forcibly to the most alluring artefacts. This work remains unsurpassed in clarity and judgment as a textbook for students and technicians, and as a groundwork for sincere practitioners of tropical medicine.

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THE LANCET

LONDON: SATURDAY, OCT. 3, 1953

Mitral Stenosis

IN the past few years much has been learnt about mitral valve disease; but many problems are still unsolved. The published results of mitral valvotomy are encouraging, with 60–80% of patients greatly improved; but the mortality-rate lies between 5% and 10%.[1–3] The number of patients who die, or are not improved, as a result of the operation might be reduced by better selection of cases. Such selection is often difficult, since it is not always possible to predict whether a valve will be amenable to satisfactory valvotomy, or whether other factors may prevent a successful outcome.

The great diagnostic difficulty is in detecting the valve which is incompetent as well as narrowed. Pure, or greatly predominant, mitral incompetence can usually be detected readily enough by physical and radiographic examination[4]; but when mitral incompetence is associated with significant stenosis, diagnosis may be much more difficult. Any or all of the following signs, in association with those of mitral stenosis, should arouse suspicion: an apical systolic murmur of more than moderate (grade III) intensity, a soft first heart sound and opening snap of the mitral valve, left ventricular enlargement, cardiographic signs of increased left ventricular dominance, and a very large left auricle on fluoroscopy. The pulse is full,[2] rather than of small volume as in pure severe mitral stenosis. There are many further methods of assessing the degree of mitral incompetence—notably observation of the form of the pulmonary capillary venous pulse by wedging the cardiac catheter in a small branch of the pulmonary artery.[5 6] A large positive wave in ventricular systole suggests incompetence.[6 7] Although there have been contrary reports,[8 9] there is evidence that the pulmonary capillary venous pulse reflects pressure changes in the left auricle[6 10]; but a pattern constant enough to be diagnostic of mitral incompetence has not so far been agreed on, and similar curves may be found both with predominant mitral stenosis and with predominant mitral incompetence.[11] The œsophageal auricular pulse tracing and the electrokymogram have not proved helpful[12]; while systolic expansion of the left auricle on fluoroscopy, although present in pure incompetence,[4] is also often seen in mitral stenosis.[2 12] A loud systolic murmur at the apex is probably the most important single sign of mitral incompetence[13]; it may occasionally be present in stenosis,[12] but in this event the first sound is usually loud and the opening snap of the mitral valve clear.[2] Careful clinical and radiological examination remains the most satisfactory method of diagnosing mitral incompetence. Slight incompetence is no bar to operation, and may be reduced by successful valvotomy; but in the presence of pronounced incompetence valvotomy is useless. Attempts to improve the function of incompetent valves by pericardial grafts and slings[3 14] have not yet proved wholly successful, and until we have a reliable operation for mitral incompetence the condition of the mitral valve must be very carefully assessed before valvotomy is undertaken.

In severe mitral stenosis the pulmonary vascular resistance is almost invariably increased; and high levels of pulmonary arterial pressure are commonly recorded. There is little doubt that both functional[15–18] and organic[19 20] narrowing of the smaller pulmonary arteries occurs, and may be proportional to the degree of pulmonary hypertension.[21] According to LEWIS et al.,[22] when the area of the mitral valve (calculated by the formula of GORLIN and GORLIN[23]) is 1·0 sq. cm. or less, and the pulmonary venous pressure rises to levels close to the colloid osmotic pressure of the plasma, narrowing of the smaller pulmonary arteries protects the pulmonary capillaries from the onslaught of the hypertrophied right ventricle. By contrast, MCGREGOR et al.[24] found that inhalation of oxygen produced a fall in pulmonary arterial pressure in 13 patients with increased pulmonary vascular resistance; and they suggested that constriction of the pulmonary arterioles might be the result of anoxia secondary to pulmonary congestion and œdema, rather than a protective change induced by pulmonary venous hypertension. The exact mechanism is still undecided, but pulmonary hypertension is an indication for operation,[1 2] and often a fall in pressure follows successful valvotomy.[1 25] Low-grade active rheumatic carditis, which may be very difficult to detect, may militate against success. Valvotomy obviously cannot be considered in the presence of acute carditis; but vague joint pains and a moderately increased erythrocyte-sedimentation rate or antistreptolysin titre may have to be ignored when urgent symptoms of mitral stenosis demand operative relief. Even in cases where there is no clinical evidence of active carditis, biopsy material taken from the left auricular appendix at operation shows changes suggesting active carditis in 30–50% of cases[26]; but these stigmata are not incompatible with excellent operative results.[2 26] Auricular fibrillation, while not a contra-indication to operation, indicates added risk, partly because of possible embolism from the left auricle during operation, and partly because the disease is likely to be at a later stage than in cases where there is no fibrillation.[1] Fibrillation develops

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2. Logan, A., Turner, R. *Lancet*, 1953, i, 1007.
3. Bailey, C. P., Bolton, H. E., Redondo-Ramirez, H. P. *Surg. Clin. N. Amer.* 1952, **32**, 1807.
4. Brigden, W., Leathem, A. *Brit. Heart J.* 1953, **15**, 55.
5. Hellems, H. K., Haynes, F. W., Dexter, L., Kinney, T. D. *J. Physiol.* 1948, **155**, 98.
6. Lagerlöf, H., Werkö, L. *Scand. J. clin. Lab. Invest.* 1949, **1**, 147.
7. Gorlin, R., Haynes, F. W. Goodale, W. T., Sawyer, C. G., Dow, J. W., Dexter, L. *Amer. Heart J.* 1951, **41**, 30.
8. Ankeney, J. L. *Circulation Res.* 1953, **1**, 58.
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10. Epps, R. G., Adler, R. H. *Brit. Heart J.* 1953, **15**, 298.
11. Venner, A., Holling, H. E. *Ibid*, p. 205.
12. Abelmann, W. H., Ellis, L. B., Harken, D. E. *Amer. J. Med.* 1953, **15**, 5.
13. Biörck, G., Axen, O., Krook, H., Andren, L., Wulff, H. B. *Amer. Heart J.* 1953, **45**, 13.
14. Logan, A., Turner, R. *Lancet*, 1952, ii, 593.
15. Ball, J. D., Kopelman, H., Witham, A. C. *Brit. Heart J.* 1952, **14**, 363.
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17. Holling, H. E. *Brit. med. Bull.* 1952, **8**, 358.
18. Hickam, J. B., Cargill, W. H. *J. clin. Invest.* 1948, **27**, 10.
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20. Larrabee, W. S., Parker, R. L., Edwards, J. E. *Proc. Mayo Clin.* 1949, **24**, 316.
21. Goodwin, J. F., Steiner, R. E., Lowe, K. G. *J. Fac. Radiol., Lond.* 1952, **4**, 21.
22. Lewis, B. M., Gorlin, R., Houssay, H. E. J., Haynes, F. W., Dexter, L. *Amer. Heart J.* 1952, **43**, 2.
23. Gorlin, R., Gorlin, S. G. *Ibid*, 1951, **41**, 1.
24. Macgregor, M., Bothwell, T. H., Zion, M. M., Bradlow, B. A. *Ibid*, 1953, **46**, 187.
25. Werkö, L., Eliasch, H., Berglund, F., Crafoord, C. *Ann. Surg.* 1952, **135**, 290.
26. Biorck, G., Winblad, S., Wulff, H. B. *Amer. Heart J.* 1952, **44**, 325.

after operation in some 30% of patients, and in half of these it becomes established despite attempts at conversion to sinus rhythm.[1] Heavy calcification of the mitral valve is an unfavourable feature which may prevent adequate valvotomy.[1]

The results of valvotomy are best in patients under the age of 40, with slight or moderate cardiac enlargement, pure tight mitral stenosis (usually with pulmonary hypertension), slight or absent valvular calcification, sinus rhythm, and no other valve lesion. A large heart, auricular fibrillation, heavy valve calcification, or slight mitral incompetence do not contra-indicate valvotomy but limit the improvement. Severe aortic incompetence and predominant mitral incompetence are absolute contra-indications to mitral valvotomy. Tricuspid lesions do not necessarily contra-indicate operation,[1] while the development of operations for the relief of aortic stenosis [27] may make simultaneous aortic and mitral valvotomy possible. A history of systemic embolism is now usually regarded as an indication for operation rather than the reverse.[3] Mitral valvotomy should be considered in any patient with progressive symptoms due to mitral stenosis, and is urgently indicated in the presence of attacks of paroxysmal dyspnœa at rest and pulmonary œdema, especially in pregnancy.[1 2 28] Assessment of benefit from the operation at present depends mainly on improvement in, or disappearance of, symptoms; changes in the physical signs of mitral stenosis and pulmonary hypertension; diminution in heart size; and reversion of cardiographic signs of right ventricular hypertrophy. Cardiac catheterisation may reveal a fall in pulmonary arterial pressure after operation; but postoperative catheterisation is not always practicable or desirable, and other objective tests of improvement, such as those of respiratory function [29] and exercise tolerance,[30] are required.

Many questions have still to be answered. Will the mitral valve become narrowed after valvotomy as a result of further attacks of rheumatic infection or fibrosis; how may low-grade active carditis be detected, how treated, and how prevented; what is the mechanism of dyspnœa and of the pulmonary vascular changes; and how can the degree of mitral incompetence be reliably detected before operation?

Tuberculous Meningitis

FURTHER welcome evidence of the value of isoniazid in the treatment of tuberculous meningitis is described in our columns this week. Dr. FLETCHER estimated the isoniazid levels in the cerebrospinal fluid (C.S.F.) in 15 patients with tuberculous meningitis by two chemical methods, and controlled the results by a biological method. Despite the vagaries and difficulties of the chemical methods, he found that he was measuring active isoniazid. With a daily dosage of 200 mg., adequate bacteriostatic levels prevailed throughout the illness, thus confirming the biological findings of KLEE [31] and GEHRT.[32] With a daily dosage of 10 mg. per kg. of body-weight (two or three times the former dosage) the C.S.F. levels were significantly higher; but, while there was still no evidence of toxicity with these doses, FLETCHER suggests that little purpose is served by having very high levels of circulating isoniazid since these are not necessarily associated with higher therapeutic activity. Dr. TORRES-GOST reports on large series of patients with tuberculous meningitis who received intramuscular streptomycin combined with oral and intrathecal isoniazid. He emphasises the great improvement in the outlook since isoniazid was introduced. Among his first 100 patients given a three-month course, there were only 6 deaths. Of the others, 61 were under observation for 3–7 months after their treatment; 34 of these had been discharged to their homes without relapse, while 27 were still in hospital with 10 relapsing. The relapses were mild and responded well to further treatment. In 7 cases there were mild paralytic sequelæ, but none involved serious disability. TORRES-GOST remarks that suppression of the acute phase does not necessarily imply permanent cure; and it will be instructive to see a later follow-up of this series and compare it with the results after streptomycin alone, as given by DEBRÉ [33] (who reported a survival-rate of just under 50%, with most of the deaths in the first 6 months) and by CAIRNS and SMITH [34] (survival-rate of 50–60% after 18 months). It may seem, in view of FLETCHER's work, that intrathecal administration of isoniazid may be unnecessary; but TORRES-GOST found no intolerance to the intrathecal injections, nor difficulty in giving them. GEHRT [32] has shown, too, that intrathecal isoniazid does not cause an increase in the C.S.F. cell or protein content. Dr. ANDERSON and his colleagues (p. 691) obtained successful results by giving streptomycin intramuscularly and intrathecally for 1 or 4 weeks only and relying mainly on isoniazid (10 mg. per kg. of body-weight daily for 16 weeks). Although in 3 patients out of 7 the disease was "advanced" on admission, they had no deaths. (CLARK et al.[35] reported 3 deaths among 10 patients with tuberculous meningitis treated with isoniazid alone.) ANDERSON et al. chose comparable controls from patients previously treated with streptomycin, and showed that the temperature fell and the C.S.F. returned to normal more rapidly in the patients who were given isoniazid than in those treated with streptomycin; in those given isoniazid the clinical recovery was very rapid. They point out that the patients were much happier with the smaller number of intramuscular and intrathecal injections. CLARK et al.[35] suggested that much of the intrathecal interference could be avoided by giving isoniazid by mouth and streptomycin by mouth and intramuscularly. These clinical results agree fully with the histological findings of RITCHIE, TAYLOR, and DICK,[36] who noted that the lesions of miliary tuberculosis and tuberculous meningitis undergo resolution during treatment with isoniazid, while with administration of streptomycin similar lesions become fibrosed; in patients treated with both agents, the isoniazid effect predominates.

In deciding on the treatment of choice in tuberculous meningitis, the possibility of giving only isoniazid by mouth must be considered. Its action is rapid and effective, and its administration involves no unpleasant-

27. Bailey, C. P., Redondo Ramirez, H. P., Larzelere, H. B. *J. Amer. med. Ass.* 1952, **150**, 1647.
28. Logan, A., Turner, R. *Lancet*, 1952, i, 1286.
29. Stock, J. P. P., Kennedy, M. C. S. *Ibid*, July 4, 1953, p. 5.
30. Bruce, R. A., Rodgers, D. L. *Amer. J. Med.* 1953, **15**, 35.
31. Klee, P. *Dtsch. Med. Wschr.* 1952, **77**, 578.
32. Gehrt, J. *Ibid*, p. 901.
33. Debré, R. *Amer. Rev. Tuberc.* 1952, **65**, 168.
34. Cairns, H., Smith, H. V. *In* T. H. Sellors and J. F. Livingstone's Modern Practice in Tuberculosis. London, 1952; vol. 2, p. 353.
35. Clark, C. M., Elmendorf, D. F. jun., Cawthorn, W. U., Muschenheim, C., McDermott, W. *Amer. Rev. Tuberc.* 1952, **66**, 391.
36. Ritchie, G. M., Taylor, R. M., Dick, J. C. *Lancet*, Aug. 29, 1953, p. 419.

ness. The Medical Research Council,[37] however, showed that a third of all patients with pulmonary tuberculosis treated with isoniazid alone developed resistant variants in 3 months; and this figure was reduced to 2% when streptomycin and isoniazid were used in combination. Possibly these figures apply only to "open" lesions; with the "closed" lesions of miliary tuberculosis and tuberculous meningitis, the risk of resistance might be much smaller. Even so, it would seem desirable to use a combination of both, at the expense of some unpleasantness to the patient in the form of intramuscular streptomycin, especially as this does not impair the efficacy of the isoniazid.[35 36] Since sufficient isoniazid enters the C.S.F. after oral administration to be bacteriostatic, intrathecal injections, using the non-irritant isoniazid, may perhaps be confined to very acute cases when lumbar puncture is being done for diagnostic purposes. It remains to be seen how little streptomycin is needed to prevent the development of strains resistant to either drug. We need now to know the results in a series of patients treated with isoniazid by mouth daily and with streptomycin by intramuscular injection every second or third day. Variants resistant to either streptomycin[38] or isoniazid[39] may be present before any treatment is given, in which event the use of *p*-aminosalicylic acid with the other drug may have to be considered. In this form of tuberculosis the aim must be to get the lesions to resolve as completely as possible; but it is unlikely that any treatment will prove universally successful.

The Death Sentence

EVERY year some dozen people are judicially hanged in England and Wales; and their deaths are often attended by much unwholesome public excitement.[40] But this important effect of executions, since it cannot be abolished without abolishing the penalty itself, did not fall within the terms of reference of the Royal Commission on Capital Punishment.[41] The members of the commission were called to discuss only "whether liability under the criminal law in Great Britain to suffer the death penalty should be limited or modified, and if so to what extent and by what means"; and they were expressly told that the continuance or discontinuance of capital punishment was not for them to consider.[42]

37. Medical Research Council, *Ibid*, Aug. 1, 1953 p. 217.
38. Pyle, M. M. *Proc. Mayo Clinic*, 1947, **22**, 465.
39. McDermott, W., Muschenheim, C., Clark, C. M., Elmendorf, D. F. jun., Cawthorn, W. U. *Trans. Ass. Amer. Phycns*, 1952, **65**, May.
40. *Lancet*, 1953, i, 280.
41. Royal Commission on Capital Punishment, 1949–53. London: H.M. Stationery Office. 1953. Pp. 506. 12*s*. 6*d*.
42. The members were Sir ERNEST GOWERS (chairman); Sir ALEXANDER MAXWELL, formerly permanent under-secretary to the Home Office; Earl PEEL, who resigned in 1950; Sir WILLIAM JONES, formerly clerk of the peace for Denbighshire; Dame FLORENCE HANCOCK, chief woman research officer of the Transport and General Workers Union; Mrs. E. D. C. CAMERON (Miss Elizabeth Bowen, the novelist); Mr. JOHN MANN, convener of the Lanarkshire County Council; Mr. N. R. FOX, Q.C., recorder of Bournemouth; Mr. HORACE MACDONALD, member of the executive committee of the Working Men's College; Prof. G. A. MONTGOMERY, Q.C., professor of Scots law at Edinburgh; Mr. LEON RADZINOWICZ, director of the department of criminal science at Cambridge; and Dr. ELIOT SLATER, physician in psychological medicine at the National Hospital for Nervous Diseases.

In this country liability to suffer the death penalty is already considerably modified by the Royal prerogative of mercy. Of 1210 murderers sentenced to death in the first fifty years of our century, 23 had their conviction quashed on appeal, 47 were certified insane, and 506 were reprieved. In every case the Home Secretary had the task of reviewing all the circumstances extenuating the crime—including those which had not been brought into evidence at the trial—and of deciding whether he could conscientiously ask the Sovereign to exercise the prerogative. It is a curious system, throwing much responsibility on the Minister and his advisers, and causing a solemn judgment to be pronounced unnecessarily upon a large number of frightened people; yet, as the report puts it, the system "works well in the sense that it produces results generally regarded as broadly satisfactory."—"Broadly satisfactory," that is, within the law as it stands at present. Similarly, in so far as it is possible to manage an execution by hanging humanely for the victim, the methods applied in our prisons are humane: in England and Wales the time elapsing between the summoning of the prisoner and the act of execution is 9–25 seconds—one of the most impressive facts in the report. But of course no expedition in the final act can relieve the prisoner and his family of the mental anguish of the weeks following the sentence, with its alternating periods of hope and despair.

Hanging itself is believed to be an immediate and painless death, comparing favourably in these respects with electrocution and lethal gassing. Members of the commission visited America in order to establish this; and the report gives their sound reasons for believing it to be so. Nevertheless, judicial hanging is claimed to have a "uniquely deterrent" effect which—if it exists—must be due to the grim associations of the gallows. Actually, there is no clear evidence that it has such an effect, and there is no particular reason why it should. Murderers do not form a homogeneous group: many of them act under sudden provocation, and murder is their solitary act of criminal behaviour; others are not of a type to be deterred by anything demanding an act of imagination. The commission sum up by saying:

> "there is no clear evidence in any of the figures we have examined that the abolition of capital punishment has led to an increase in the homicide rate, or that its reintroduction has led to a fall."

The idea of the "uniquely deterrent" effect, however, influences public opinion; and so does the desire for retribution, which is used by some as an argument against the introduction of euthanasia. "Why should a man who has coshed an old woman," the plain man understandably asks, "get an easier death than most of us can expect in the course of nature?" The commission, however, state plainly their approval of the principle of euthanasia: "if we could have been satisfied that executions could be carried out in this way quickly, painlessly and decently in all cases, we should have recommended its adoption unanimously." They were deterred, curiously enough, by the difficulties put before them by medical witnesses, who seem to have been more anxious to ensure that no doctor should take part in an execution than to give the problem detached consideration. The commission do recommend, how-

ever, that this question should be periodically examined, with a view to a change of system being proposed to Parliament. We are fully of their opinion; for whatever risks there may be in substituting euthanasia for judicial hanging, there can be no doubt that such a change would relieve beyond measure the sufferings of the condemned man's family, and do much to diminish the morbid interest of the public. We also warmly support their recommendation (unfortunately not unanimous) that the death penalty should not apply to anyone under 21, the accepted age of adult responsibility.

The outstanding defect of the law of murder is that it provides a single punishment for a crime varying widely in culpability: fifty cases reviewed by the commission, in an appendix, show vividly how impossible it is to speak of "murderers as a class." We, as doctors, wish to feel confident that the death penalty does not befall any patient who, because of mental illness or abnormality, kills another person; and in recent years our concepts of mental illness and abnormality have so widened as to affect the legal definitions set out in the McNaughten rules. The commission suggest that the rules might be extended to cover the fact that in some cases the accused, though he may know the nature of his act, and know that it is wrong, may be incapable of preventing himself from committing it. They think it would be even better, however, to abrogate the McNaughten rules and leave the jury to determine whether at the time of the crime the accused was suffering from disease of the mind or mental deficiency to such a degree that he ought not to be held responsible. This would take account of emotionally disturbed patients, including many guilty of sexual crimes, and of other abnormal people, including those of psychopathic personality; but of course it is difficult to know how the change would work out in practice—some juries perhaps being ready to accept psychological explanations while others were not. It is disappointing, in this connection, that the commission specifically do *not* recommend a change of procedure which many of us have long thought desirable, and not only in murder cases—namely, the appointment of expert medical witnesses by the court rather than by the prosecution or the defence. This, they say, would mean a fundamental change in the procedure of the courts and would have repercussions beyond the field of their inquiry.

They do, however, propose that in England and Wales the mental state of every prisoner charged with murder should be examined by two doctors, of whom one at least should be a psychiatrist of standing who is not a member of the prison service, and the other usually an experienced member of that service. The judge, in both England and Scotland, should be given the power, they think, to raise the issue of insanity, to call relevant evidence, and to put the issue to the jury, if he has reason to believe that the accused may have been insane at the time of the offence, and that the trial of this issue would be in the interests of justice; and they urge the immediate need for the establishment of an institution for the detention and treatment of psychopaths and other prisoners who are mentally abnormal though not insane, and for research into the problems of psychopathic personality.

Much comment has already been excited by the commission's revolutionary suggestion that the jury, having in the first part of the trial decided the question of guilt, should then be presented with evidence of extenuating circumstances, and be asked to say whether these were sufficient, in their opinion, to make a death sentence inappropriate. This system, they say, is found to work well on the whole in countries where it has been adopted. Whether such a system would be acceptable here is a matter for discussion with the legal profession; but it is noteworthy that the commission believe that, if it is not acceptable, this country has reached a stage at which little more can be done effectively to limit the liability to suffer the death penalty. The issue would then become whether capital punishment should be retained or abolished. And, indeed, we believe this to be the live issue. It seems that the commission have worked very hard and conscientiously to find ways of reducing judicial executions in a system where they are already as limited as existing law allows. Their recommendations would reduce the numbers sentenced to death and then reprieved (which would be an unquestionable gain), and would also reduce slightly the number at present executed—particularly among those who are mentally abnormal but not insane, in so far as these can be detected by present psychological methods. The public conscience might then revolt against sparing the untreatable psychopath and executing the sane man, possibly capable of reform. But surely it is time to be done altogether with a penalty which can never do more than rough justice to any criminal, which almost always entails suffering to innocent people, and which helps to keep murder and murderers perpetually in the limelight.

Annotations

EPIDEMIC VOMITING

"EPIDEMIC vomiting" ("epidemic nausea," "winter vomiting disease") is an entity on its own, and several striking epidemics have been recorded in the past ten years, notably in girls' schools.[1–3] Webster[4] has now recorded another epidemic of some 313 cases in a girls' school. This began at the end of September, slowly rose to an explosive peak on Oct. 11, and faded out gradually over the next few days. The illness was confined to the school and family contacts, and in these groups the attack-rate was high. It appeared to be spread by close personal contact, and to have an incubation-period of less than 5 days. The notable symptoms were: abrupt onset of vomiting, generally with profound prostration (75% of cases); nausea (28%); headache (40%); abdominal pain (57%); giddiness (36%); and diarrhœa, slight and transitory with only one or two loose stools (30%). People of all ages were attacked, and the clinical features were constant throughout the whole age-range. The duration of symptoms varied from a few hours up to a day or so; recovery was rapid, and there were no sequelæ. In this outbreak there seemed to be no associated upper respiratory infection. There was nothing to suggest infection from the school water-supply or even from the school canteen; and, as in other outbreaks, the infection was thought to be airborne. Such virus studies as were done on blood and nasal washings yielded negative results.

1. Bradley, W. H. *Brit. med. J.* 1943, i, 309.
2. Silverton, M. I. *Med. Offr.* 1952, **88**, 215.
3. Dummer, F. H. M. *Ibid*, 1953, **89**, 65.
4. Webster, R. C. *Ibid*, 1953, **90**, 39.

Out of the welter of ill-defined acute virus infections which seem to exist in this and other countries, this mild winter epidemic infection seems to be qualifying for general recognition.

"URÆMIC LUNG—FLUID LUNG?"

IN an article under this heading Alwall et al.[1] answer their own question by saying that this is the first of a series on "electrolyte-fluid retention." Neither of the two names is particularly pleasing, since the disturbance that they describe has often been observed in patients without uræmia, while a "fluid lung" is literally impossible. But the fact that exception can be taken to both these terms does not mean that a more suitable name is easily devised. Pathologists agree that the type of œdema found in the lungs is non-specific; and the syndrome could be defined as "acute localised pulmonary œdema with X-ray shadowing in association with acute fluid retention and left ventricular failure"—a description that can hardly be shortened except by omitting one or other feature which differentiates this from other syndromes more or less closely related to it.

This type of acute localised pulmonary œdema was first reported in the '30s by Continental workers [2 3], who found it in association with renal failure and hypertension and gave it the name "uræmic œdema." This name it has now retained with dwindling justification for twenty years. In 1941 the typical radiographic appearance was described of fan-shaped opacities radiating from the hilum, but tending to spare the peripheral lung-fields.[4] Doniach,[5] who examined the lungs in four cases, found a non-infective albuminous and fibrinous pulmonary œdema in various stages of organisation. He pointed out [6] that the same type of œdema could occur apart from uræmia—for example, with cardiac failure due to myocardial infarction or mitral stenosis. Pathologically, the changes could not be distinguished from those of so-called "rheumatic pneumonia." He added that the "peculiar butterfly-shaped distribution of the transudate in the lungs remains an enigma." Bass and Singer [7] were perhaps the first to emphasise the importance of left ventricular failure, noting the disappearance of the altered lung shadows as this responded to treatment; they also cited Dock's explanation of the distribution of œdema, based on the relative immobility of the hilar parts of the lung, by comparison with the periphery, in which ventilation might hinder the accumulation of fluid.

Alwall and his colleagues now bring forward clinical and experimental evidence confirming the importance of fluid retention in causing this type of pulmonary œdema. They studied fourteen patients with chronic renal failure, and two with anuria from acute tubular necrosis, all of whom were notably dyspnœic and had the characteristic radiographic appearances. Diarrhœa was induced by a daily dose of 200–400 ml. of 25% or 50% sodium sulphate, no other fluid being given; if the patient vomited, 100 ml. of 25% sodium sulphate was given as an enema three or four times daily. On this stern régime, the patients' weight fell by as much as 4 kg. a day; there was a dramatic recession of the pulmonary shadowing, and dyspnœa was relieved. In experiments on rabbits the ureters were ligated, a control radiograph was taken, and an amount of "liquid" corresponding to 15% of the body-weight was infused; radiographic examination then showed extensive pulmonary shadowing, which disappeared when the excess of body-fluid was removed by dialysis. In an addendum to their paper they mention the removal of "a life-menacing pulmonary œdema" by five hours' treatment with Alwall's type of artificial kidney.[8]

Although retention of fluid may clearly precipitate acute localised pulmonary œdema, many patients with massive œdema, as in type-II nephritis, have no dyspnœa and no pulmonary shadowing—suggesting that some additional factor promotes localisation of part of the excess fluid in the lungs. The frequency of this type of pulmonary change not only in chronic nephritis, in which it was first described, but also in anuria and acute nephritis, suggests that this additional factor may be left ventricular failure secondary to hypertension. The importance of cardiac failure has recently been emphasised both in anuria [9] and in acute nephritis.[10] The recognition of acute localised pulmonary œdema is perhaps more important in these acute and reversible conditions than in chronic renal failure; and the possibility of it strengthens the case for fluid restriction and complete bed rest in the management of anuria and acute nephritis.

MENTAL NURSING IN DECLINE

OF the hospital beds in this country no less than 40% are in mental hospitals; but this large group does not command anything like its proper proportion of our nursing resources. As is now widely recognised, the nursing service of mental hospitals, though it includes many first-class men and women, is, in general, insufficient and therefore poor. Since trained staff are few, and recruits for training are getting fewer, much of the burden of mental nursing is carried by people for whom no systematic course of training is at present laid down.[11] This is a dangerous situation: we could easily slip back to the cruelty and degradation of the old bedlams, from which we are little more than a century removed.

A contributor to the *Male Nurses Journal* [12] makes some constructive suggestions. He points out that many of the old chronic patients in mental hospitals do not need any mental nursing at all—only kindly care and general nursing of the type given in the geriatric wards of a general hospital or in rest homes for the aged. Such patients might well be transferred to such wards and homes, thus releasing beds for acutely ill mental patients likely to benefit by modern treatment. Accommodation of the type suggested, however, is still very scarce; it would have to be greatly extended before this proposal could be put into practice. Nevertheless, it would certainly promote economy in the use of qualified mental nurses and help to ensure that they were doing the work for which they were trained.

Like us, this writer believes that student nurses in general training might well spend three months in mental hospitals. This plan, we have suggested, might be tried first at Hill End, St. Albans, where a teaching general hospital (St. Bartholomew's) and a mental hospital are already sharing the same buildings.[13] He also proposes an interchange of administrators between general and mental hospitals, so that they may get a better grasp of each other's background and problems, and thus come to coöperate more easily. In the manner of the Prime Minister, in the days when he offered us blood and tears, he calls for posters pointing out that nurses are needed in mental hospitals and that it is hard work demanding courage and patience. As a long-term policy he advocates converting the mental hospitals into hospitals for the treatment of organic and functional nervous disorders (which would naturally include mental disorders). Such a hospital would carry neurological wards as well as wards for the neurotic and psychotic, and would have an associated research unit. The name of the hospital could then be changed to "Somebody's Hospital for

1. Alwall, N., Lunderquist, A., Olsson, O. *Acta med. scand.* 1953, **146**, 157.
2. Rubier, C., Plauchu, M. *Arch. méd. chir. Apprar. resp.* 1934, **9**, 189.
3. Klima, R., Rosegger, H. *Med. Klin.* 1936, **32**, 85.
4. Rendich, R. A., Levy, A. H., Cove, A. M. *Amer. J. Roentgenol.* 1941, **46**, 802.
5. Doniach, I. *Ibid*, 1947, **58**, 620.
6. Doniach, I. *Lancet*, 1949, ii, 911.
7. Bass, H. E., Singer, E. *J. Amer. med. Ass.* 1947, **144**, 819.
8. Alwall, N. *Acta med. scand.* 1947, **128**, 317.
9. Swann, R. C., Merrill, J. P. *Medicine, Baltimore*, 1953, **32**, 215.
10. Peters, J. P. *Amer. J. Med.* 1953, **14**, 448.
11. *Lancet*, July 25, 1953, p. 177.
12. September–October, 1953, p. 13.
13. *Lancet*, 1953, i, 641.

Nervous Disorders"; and this, as he says, would soon be contracted to "Somebody's Hospital," and the term "mental nurse" to plain "nurse"—the most sensible name.

Meanwhile recruitment to the mental nursing service could be fostered, he thinks, if the trained staff and the public were in closer touch. The hospitals could hold open days, with full civic and press support, when visitors would be taken round the wards and laboratories on conducted tours. Trained staff could give talks to women's institutes, senior schools, associations of teachers, and industrial and youth organisations. Patients who are well enough could attend local meetings in which they are interested—of church groups, Women's Voluntary Service, farmers' unions, and clubs, as well as educational and Red Cross courses. The leagues of Friends of Mental Hospitals should be helped to extend their activities to all parts of the country; where they are active they are already doing much to create good feeling between the hospitals and the public. Such increased commerce between the hospital and the outside world would help to break down the isolation in which the mental hospital residents—patients and staff alike—at present live. The hospitals are isolated in another sense: each of them is a separate community, with its own customs and methods, and there is very little interchange of ideas—anyhow of nursing ideas—between one hospital and another. It is a long-standing weakness of the service, which might be overcome more easily if there was some coördinating body—some association or group to which all mental hospitals belonged—which would publish information about the work of its various members.

TINEA CAPITIS

THOSE dismayed by the advancing tide of warts may feel that the employment of a squad of reliable wart-charmers would be a legitimate charge on public funds. The activities of the Ulster ringworm charmers [1] are less admirable. Their good reputation, like that of some more orthodox practitioners, rests on the tendency of some diseases to get better without treatment. This happens particularly often in human infections with ringworm fungi normally parasitic on animals.

In dealing with a large epidemic of ringworm in Northern Ireland, Beare and Cheeseman [1] found it unnecessary to treat cases of tinea capitis due to *Microsporum canis* by the conventional method of X-ray epilation: this they reserved for cases due to *M. audouini* and *Trichophyton sulphureum*. *M. canis* infects kittens, which are the main reservoir of contagion. Beare and Cheeseman's' maps showing the distribution of their cases in Belfast indicate clearly that infections with *M. canis* were sporadic, whereas those due to *M. audouini* were concentrated in two main areas, suggesting case-to-case spread. This is the usual experience, although according to Kligman [2] *M. canis* can cause wider outbreaks when it mimics *M. audouini* by producing non-inflammatory lesions with less tendency to rapid spontaneous healing.

Thomas [3] has also reported that it is not essential either to treat *M. canis* infection with X rays nor to keep infected children from school. Whittle [4] has witnessed an epidemic of scalp infection with *M. audouini* in which most cases responded to simple local measures. It is true that he was dealing with a rather feeble variant of the parasite, but it is valuable to know that such variations in virulence occur. Kligman's work, the most interesting on the pathogenesis of tinea capitis since the days of Sabouraud and Adamson, shows how far the course of infection may depart from what is usually expected.

The main object in insisting on treatment is to protect not so much the patient as the community. Beare and Cheeseman's report illustrates how careful clinical examination, good contact tracing, mycological investigation, and prompt treatment can curtail epidemics. X-ray epilation is not the ideal routine treatment; for it requires faultlessly calibrated machines and skilled operators experienced in the technique, if disproportionate risks are not to be taken. Dermatologists look forward to the development of antibiotics effective against fungi. Those causing the various forms of ringworm live exclusively in keratin; and a substance may be found which, excreted by the horny layer, nails, and hair, will offer the parasites their hemlock disguised as a favourite metabolite.

GREAT EXPLORATIONS

Sir Henry Dale's friends have fortunately been able to persuade him to make, and to issue in one volume,[1] his own choice of his published writings. He has written a charming and illuminating introduction, and has added retrospective commentaries to the individual papers. These papers are landmarks in an eventful career: some are also landmarks in the history of science. In 1910 Barger and Dale introduced the word "sympathomimetic" to describe the action of various amines which parallel, in varying degree, the excitatory and inhibitory effects of sympathetic-nerve stimulation. In 1914 Dale first described the pharmacology of acetylcholine, which his colleague Ewins had isolated from ergot, and drew attention to its muscarine-like and nicotine-like aspects. In 1929 Dale and Dudley, searching for histamine in the spleens of ox and horse, detected enormous choline-like activity and announced the first chemical isolation of acetylcholine from animal tissue. In 1933 Dale proposed the terms "adrenergic" and "cholinergic." There followed the well-known papers, with Brown, Feldberg, Gaddum, and Vogt, on cholinergic transmission, the subject with which Dale's name is linked by every student of physiology in the world today.

For the experimental pathologist another set of landmarks stands out. In 1910 Dale and Laidlaw first described the pharmacology of histamine, noted the different distribution of its stimulating effect on plain muscle in a variety of species, and cautiously compared these actions with the phenomena of anaphylaxis. In 1913 Dale found that plain muscle from a sensitised guineapig would contract if treated in vitro with a minute dose of antigen. In 1922, Dale and Kellaway proved that such plain muscle would not contract to added antigen if free antibody were present in the bath. And in 1927 Best, Dale, Dudley, and Thorpe isolated histamine chemically from liver and lung.

Medical men will be glad to have these thirty papers bound together for convenient reference; but it is to the beginner in research that the book should make its most special appeal; for the introduction and comments, and, not less, the selection and juxtaposition of the papers, give unique insight into the scientist's work, into the growth of his ideas and of his skills. Sir Henry tells some fascinating stories of lucky accidents with ergot and liver extracts and with sensitised guineapigs thought by others to be good enough for pharmacological experiments; but his assessment of the large part played by such accidents in his success will not be taken very seriously. Many will suspect that they themselves have had similar opportunities and not known it. The comments are models of modesty. He blames himself for not having tested noradrenaline in 1910, when it was commercially available as 'Arterrenol.' Of his

1. Beare, J. M., Cheeseman, E. A. *Ulster med. J.* May 1953, **22**, suppl.
2. Kligman, A. M. *J. invest. Derm.* 1952, **18**, 231.
3. Thomas, B. A. *Brit. med. J.* 1953, i, 536.
4. Whittle, C. H. *Lancet*, July 4, 1953, p. 10.

1. Adventures in Physiology; with excursions into autopharmacology. A selection from the scientific publications of Sir HENRY HALLETT DALE, O.M., G.B.E., F.R.S., M.D., F.R.C.P. With an Introduction and recent comments by the Author. London: Pergamon Press. 1953. Pp. 652. £6 6s.

discovery in 1920 that adrenalectomy increases enormously the susceptibility to histamine shock he writes today: "My purely speculative suggestion . . . 'of an unknown function of the suprarenal cortex,' might be made to assume a certain air of prediction, if viewed in the light of what is now known; but the fact that I made no attempt to follow that line of thought by further experiments, is sufficient evidence that I myself attached no serious importance to it at that time." Exemplary caution in the use of drugs as physiological tools is shown in the paper with Laidlaw in 1912, in which it was proved that dilatation of the pupil by nicotine is not due, as might have been thought, to direct action of nicotine on the pupil, but is due to stimulation of the adrenal medulla. But perhaps the most important lesson here illustrated is that taught by Ramon y Cajal: the need to ponder for years on particular subject-matter, to achieve a degree of "cerebral polarisation," if important progress is to be made. Thus, over years, the idea of chemical transmission took hold, first for the autonomic, then for the somatic nervous system. The conception of a rapid, localised liberation and removal of acetylcholine has provoked, and been abundantly confirmed by, newer electrophysiological experiments which have accurately defined the conditions of synaptic and neuromuscular transmission.

LABORATORY DIAGNOSIS OF SMALLPOX

THE cost of this country's freedom from smallpox—constant vigilance—is buried in the expense of the preventive services generally. When the disease is detected at the ports, and still more when it slips through the cordon, energy is diverted to its control and the cost soars. An expensive administration comes into action. The cost of vaccination, surveillance, and hospital care can be readily measured; but the toll on the national energy exacted by public apprehension cannot be estimated. Confronted with a doubtful case of smallpox, the medical administrator must choose between the risky policy of waiting and the expensive policy of action. The emergence of reliable laboratory tests has reduced materially the period of doubt: instead of depending on protracted clinical observation in a smallpox hospital, he can do tests which rapidly and convincingly aid the diagnosis, often without moving the patient.

The Ministry of Health has issued a brochure [1] on the laboratory diagnosis of smallpox, for the information of medical officers of health, medical officers of seaports and airports, and others who may be concerned in the diagnosis of the disease. The document includes notes on the tests available, a reproduction of an article by MacCallum,[2] instructions for collecting and dispatching specimens, a list of laboratories available for performing the tests, and a list of the Ministry's clinical consultants in smallpox. The limitations of the laboratory methods are noted, and emphasis is placed on the tests as aids to clinical diagnosis, not as substitutes for it.

The most useful tests are those in which the virus or its antigen is sought in the local lesions. Direct microscopic examination of smears from early lesions rapidly confirms a clinical diagnosis, but a negative result does not exclude the disease; and the test is not reliable from the pustular stage onwards. The complement-fixation test is much more reliable and provides a result in twenty-four hours. The suspected material (papule scraping, vesicle fluid, or crusts) is used as antigen against a known rabbit-serum. The third test is egg-culture of the suspected material; the result is known in 48–72 hours. Occasionally egg-culture from the blood of febrile contacts in whom the disease is developing may give a diagnostic growth by the time the rash appears. Tests for antibodies are less helpful, because antibodies do not appear until the seventh day, and recent vaccination interferes with the tests.

With these aids the clinician is more favourably placed than he has ever been before. In future, every case in which a reasonable suspicion of smallpox arises will, no doubt, be subjected to such tests. Mistakes will still be made, but they are likely to be less common and much less disturbing to the public.

1. Mem. Port 21.
2. MacCallum F. O. *J. R. sanit. Inst.* 1952, **72**, 112.

BACTERIAL L FORMS

THE obscurity surrounding the L forms of bacteria is due partly to technical difficulties, and partly to the semantic problems which bedevil discussion of their origin, fate, and significance. Pulvertaft [1] has made a commendable attempt to clear up some of the difficulties by proposing that "The name L form should be used to describe the large plastic masses." How far this restriction usage will find favour it is difficult to say. From Klieneberger's first report in 1935 [2] onwards, the definition has been very vague.

Thus Klieneberger wrote: "Organisms L_1 and L_2 the structure and life cycle . . . resemble closely the morphological development of pleuropneumonia." Dienes [3] wrote of "L type variants in cultures of various bacteria" and of "tiny secondary colonies similar in appearance and morphology to the L_1 variant of *Streptobacillus moniliformis*." Dienes and Weinberger [4] stated: "The peculiar forms which are the subject of this review . . . are called L forms and their colonies and cultures are referred to as L type." They continue: "In the description of the morphology of L type cultures, the terms 'Small forms,' 'Swollen forms,' and 'Large bodies' are employed. The latter two terms will be applied also to pleomorphic forms of bacteria." Later in the same article they wrote: "the L forms grow from the large bodies as strands of refractile granules," and "the large bodies either return to bacteria or grow into L forms."

This appears to equate the L bodies with the small forms. On the other hand, Klieneberger-Nobel, in 1949,[5] said that "the size and shape of the L bodies largely depended on the number and arrangement of the primary cell units," and referred to "a large disc-like body which because of its shape, size and structure, must be regarded as an L body." In a later paper photomicrographs of L bodies give the impression that these are small, pleomorphic masses.[6]

More recent accounts have done little to clear up the difficulties of interpretation. The reports by Wittler [7 8] on the L form of *Hæmophilus pertussis* seem to refer to pleomorphic masses equal to, or larger than, the bacterial forms. Pulvertaft's report on the effect of antibiotics on growing cultures of *Bacterium coli* [9] contains a very good account of usage of the term "L forms" and appears to distinguish filamentous forms from L forms. The usage in Stempen and Hutchinson's [10] account of large bodies in *Proteus vulgaris* is that adopted by Pulvertaft in his latest paper [1]; but Dienes and Zamecnik [11] last year differentiated large bodies from L forms. Lately Howard Hughes,[12] discussing L variants of *Bact. coli*, has introduced yet another conception: "The essential feature of an L variant would be that growth continued while division was inhibited."

Various workers claim to have found L forms in urine; and Wittler [8] showed that *H. pertussis* was in the L form when infecting mice. There is good evidence that L forms are more resistant to penicillin and other injurious

1. Pulvertaft, R. J. V. *J. Path. Bact.* 1953, **65**, 175.
2. Klieneberger, E. *Ibid*, 1935, **40**, 93.
3. Dienes, L. *Proc. Soc. exp. Biol., N.Y.* 1939, **42**, 636.
4. Dienes, L., Weinberger, H. J. *Bact. Rev.* 1951, **15**, 245.
5. Klieneberger-Nobel, E. *J. gen. Microbiol.* 1949, **3**, 434.
6. Klieneberger-Nobel, E. *Ibid*, 1951, **5**, 525.
7. Wittler, R. G. *Ibid*, p. 1024.
8. Wittler, R. G. *Ibid*, 1952, **6**, 311.
9. Pulvertaft, R. J. V. *J. Path. Bact.* 1952, **64**, 75.
10. Stempen, H., Hutchinson, W. G. *J. Bact.* 1951, **61**, 337.
11. Dienes, L., Zamecnik, P. C. *Ibid*, 1952, **64**, 770.
12. Howard Hughes, W. *J. gen. Microbiol.* 1953, **8**, 307.

substances than the normal vegetative forms.[7] An examination of the forms in which penicillin-resistant organisms appear in vivo would be of interest, as also would be an examination of cultures that are being rendered penicillin-resistant in vitro. Meanwhile we still need agreed definitions of the terms L forms, L bodies, L type cultures, small forms, and swollen forms.

CHEST WOUNDS IN WAR

CHEST wounds have always been one of the most lethal injuries in warfare. Sauerbruch, examining in 1914 the cause of death in 300 soldiers, found that 37% of them had died of gunshot wounds in the chest. It is estimated that during the hostilities in Korea one-third to a half of all the men killed died as a result of wounds in the thorax, and that in the exposed forward area thoracic injuries are twice as common as abdominal. Nevertheless, for the injured man who survives the original shock and damage, the chances of recovery have dramatically improved. It is estimated that in the first world war 27% of soldiers with chest wounds died, but in the second world war only 8%. The circumstances of the different fields of war have to be taken into account; but the improvement is undoubtedly due largely to improved methods of treatment.

King and Harris[16] have now described their experiences with 405 major thoracic casualties in Korea. As soon as an injured man is brought under medical care a decision has to be made as to whether he requires emergency treatment or can be treated more satisfactorily after evacuation to the base. Emergency treatment is needed for such complications as continued bleeding, abdominothoracic injuries, and pressure effects which require relief. For these, immediate operation is imperative; and in this Korean series, which concerns mainly the U.S. Navy and Marines, 52 thoracotomies and 43 laparotomies were done in the forward area. The majority of the wounded were, however, the victims of hæmothorax, which was most satisfactorily treated on return to base; and the average time between the injury and the definitive treatment in this series was 7 days. Hæmothorax is the principal factor in chest wounds. Treatment should consist in early and complete aspiration, with the knowledge that this can be undertaken without any fear of starting further hæmorrhage. King and Harris, who emphasise the importance of this early and complete aspiration, found that on an average they aspirated each of their patients three times, withdrawing almost a litre of fluid blood each time; but one patient was needled sixty times before the fluid was completely removed and the pleural space obliterated by re-expansion of the lung. An earlier belief, that aspiration could be accompanied by air replacement, should be discarded, because this measure does not encourage the lung to re-expand, and as a result a dead space is formed which may be the site of secondary clotting and infection. If all aspirations are kept closed, and the fluid is withdrawn without any air being admitted, the lung will inevitably re-expand and reach its proper position against the chest wall.

King and Harris feel that the operation of decortication or pleurectomy, which found favour towards the end of the late war, is unnecessary if efficient closed aspiration is carried out; and they did this operation only 4 times. Their use of ½% acetic acid and 15% glycerin in normal saline as an irrigating agent was felt to be of value in facilitating aspiration and preventing infection, which is likely to arise in a long-standing hæmothorax. There were only 25 examples of infection—owing, partly, to the continuous use of antibiotics. 80% of their patients recovered completely and were fit for duty in 90 days. The success of these methods may be judged by the fact that the mortality was only 1%. Such results are obtained only with great patience and care.

16. King, J. D., Harris, J. H. *Surg. Gynec. Obstet.* 1953, **97**, 199.

"FABER"

ANYONE who has tried to define a term, describe a method, or summarise a hypothesis has reason to understand the difficulty of compiling a dictionary containing thousands upon thousands of definitions, descriptions, and summaries. But, though they can never be perfect, dictionaries are essential tools of learning, and in medicine as elsewhere it is very necessary that we should possess such tools, well constructed and kept sharp by frequent revision. The *Faber Medical Dictionary*,[1] which made its first appearance last week, should be useful not only to doctors, dentists, and nurses but also to the many other people working in the National Health Service and elsewhere who are continually confronted with medical terms. The profession throughout the English-speaking world has been well served by American dictionaries of high merit; but to those of us who read and write in this country it is no small satisfaction to possess at last a work of comparable scope which is British in its spelling and usage.

Sir Cecil Wakeley, P.R.C.S., the editor, and his associates, give us a large but easily handled volume of the kind that lures the reader away from his proper business. Aiming at comprehensiveness, Sir Cecil has provided much that is unfamiliar and entertaining; and of course he is justified in so far as one of the functions of a dictionary is to explain words that ordinary people do not know by sight. On the other hand he has put in a good many terms which, if they have ever really been alive, few of us would wish to see brought back from the dead; and if these were excluded from the next edition there would be room for more of the up-to-date information which is a feature of the work. If, as at present, an attempt is made to include the better-known proprietary names of drugs, the selection might well be larger; and, though there is much to be said for making each item sufficient unto itself, there should always be cross-reference between proprietary and official names. (For example, Pentothal should be linked to Thiopentone.) Further, it would surely be convenient if this British dictionary made use invariably of the names approved by the British Pharmacopœia Commission. (There are entries under Desoxycorticosterone, and Deoxycorticosterone, and DOCA, but not under Deoxycortone, the *B.P.* term.) An impression given by casual perusal is that the advancing science of endocrinology does not in fact get as much attention as do monsters in their infinite variety: thus Cortisone is rather curtly dismissed as "one of the hormones of the adrenal gland used in the treatment of rheumatoid arthritis," and there is no mention of compound F. On the long and entertaining controversy over "-trophic" and "-tropic" hormones, "Faber" speaks with a certain ambiguity: we find both Adrenocorticotrophic and Adrenocorticotropic (though the derivation here does not mention *trephein*), but neither of the adjectives Thyrotrophic and Thyrotropic gets an entry, though the latter is used in describing thyroxine. We must take note, however, that another long contest has ended by Radiograph finally knocking out Radiogram. Though the better man, the latter made the mistake of fulfilling engagements elsewhere.

Taking the offensive, perhaps, against potential critics, Sir Cecil and his colleagues describe Pessimism as "a neurotic disposition always to see and to expect the worst." This downright definition, though it omits philosophical conceptions, fulfils at least the editor's aim to be concise and readily intelligible. It illustrates the robust good sense which initiated and infuses his book and which will win it many friends.

Dr. R. H. CROWLEY, a former senior medical officer of the Board of Education, died on Sept. 25 at the age of 84.

1. Faber Medical Dictionary. Edited by Sir CECIL WAKELEY, BT., P.R.C.S. London: Faber & Faber. Pp. 471. 45*s*.

International Conferences

MICROBIOLOGY

FROM A VIROLOGIST

AT the 6th International Congress of Microbiology, held in Rome during the week of Sept. 6, 2000 delegates gathered from all over the world to meet their colleagues from foreign countries, discuss their scientific problems, and listen to some 1200 scientific communications. Faced with such formidable numbers of delegates and communications, many organisations would have wilted. The Italian organising committee, under its secretary-general, E. Biocca, might have been forgiven had they decided to hold the meetings at the Colosseum and throw the speakers into the arena; instead they made a magnificent job of steering a large congress through a most complicated scientific and social programme.

When the delegates registered for the proceedings they received, among handsome gifts, three volumes of summaries of the communications, weighing 6½ lb., and a guide-book and leaflets to help them to find their way through this maze of scientific knowledge. At past microbiological congresses it has been possible for delegates, if they wished, to keep an eye on the main events taking place in perhaps five or six sections running simultaneously. But the 6th congress found it necessary to divide itself up into 22 sections, and in addition a number of symposia were run at the same time. As a result, even the most enthusiastic delegate had great difficulty in finding out what was happening even in his own small specialty. Truly Dame Microbiology has developed a middle-aged spread—probably the result of ingesting too many scientific papers. There is a great need to remove some of her unsightly bulges before the next congress, but ways of doing so are by no means easy to prescribe. Perhaps one method would be to have all communications published in the proceedings but to limit the number of communications to be read at the congress. Each country might be allotted a quota of communications to be read, and national committees could then select the required number from the communications submitted. Such a plan has many disadvantages; yet some such arrangement is urgently required if future congresses are not to develop into Microbiological Towers of Babel. A scheme of this type might also help to remove anomalies such as the reading of seven successive papers by one delegate.

Many must have been disappointed that only a small number of microbiologists from the U.S.A. were able to attend. On the other hand, it was good to see delegates from Russia, Poland, Czechoslovakia, and Hungary once more.

Work on Viruses

Faced with such a large variety of subjects there was nothing to be done except to show the most resolute single-mindedness, by choosing one section and attending it regularly; the discriminating chose the section on animal viruses.

T. WESSLEN (Stockholm) described a method of growing vaccinia virus in tissue culture of bovine embryonic tissue. Embryos are easily obtained from the slaughter-house, and Wesslen's technique seems to offer a simple and cheap method of producing bacteriologically sterile vaccine. It will be interesting to see the results of human vaccination tests with the tissue-culture virus.

A. W. DOWNIE and D. R. W. HADDOCK (Liverpool) reported a variant of cowpox virus which differed from the parent virus in cultural characteristics and showed reduced animal pathogenicity. It was interesting to find that, from apparently pure cultures of the parent virus, variants occurred with an average frequency of about 1 in 130. This surprisingly high figure might have made bacterial geneticists pause and wonder.

A. MACDONALD and K. MCCARTHY (Liverpool) discussed natural heat-labile inhibitors of a number of viruses present in normal animal and human serum and suggested that they might play a part in protecting against infection with small doses of virus.

J. B. BROOKSBY (Pirbright, England) showed how the tissue-culture technique of Fulton and Armitage could be applied to the titration of foot-and-mouth-disease virus—a method which should prove of great value in the study of this most difficult disease.

R. LUNDSTRÖM (Stockholm) estimated the risk of immaturity, congenital abnormalities, and stillbirth as three times greater in the children of mothers who had contracted rubella during the first to fourth months of pregnancy than in those of controls. Contacts of cases of rubella who were previously immune also showed an increased proportion of congenital abnormalities in their children. C. H. ANDREWES, F.R.S., found this difficult to reconcile with the protective action of gamma-globulin against rubella, and it seemed possible that the small numbers of cases might have created this impression.

M. M. SIGEL, A. J. GIRARD, and E. G. ALLEN (Philadelphia) studied the mode of multiplication of meningopneumonitis virus and found that the latent period of virus growth could be greatly prolonged by treating the tissues with aureomycin.

C. H. ANDREWES, D. CHAPRONIERE, A. GOMPELS, H. G. PEREIRA, and A. T. RODEN (Salisbury, England) announced to a most attentive audience their finding that the common-cold virus had been cultivated in tissue cultures of human embryo lung.[1]

H. B. DONALD, ALICK ISAACS, and FORREST FULTON (London) confounded the mathematicians and philosophers with their conclusion that at least ten influenza-virus particles were required to constitute one infective dose; and FULTON and ISAACS showed that when incomplete virus was grown on the chick chorion it showed unexpected signs of life. H. P. CHU (Cambridge) reported that the viruses of the influenza group agglutinated spermatozoa.

H. L. WOLFF (Leyden) observed that adults who had previously had mumps in childhood react on contact with the virus by producing a rapid increase in complement-fixing antibody. He used this in order to make an early serological diagnosis of mumps. By examining the patient's serum and that of his parents, nurses, &c., Wolff is often able to reach an accurate diagnosis of mumps on the first day of illness.

I. ARCHETTI (Rome) compared neutralisation and agglutination-inhibition tests in the study of influenza vaccines and found the former a more sensitive method.

POLIOMYELITIS

The recent technical advances in the study of poliomyelitis were reflected in many interesting communications and discussions on this subject. J. D. VERLINDE (Leyden) described the distribution of the three types of poliomyelitis virus in Holland; and he stimulated discussion of this subject by speakers from France, Sweden, South Africa, and the U.S.A. Although the types were differently distributed in these countries there seemed to be general agreement that type-1 virus was the commonest and that type-2 virus tended to be associated with sporadic cases.

A. B. SABIN, J. WINSSER, and W. A. HENNESSEN (Cincinnati) had some extremely interesting findings on what they called the pathogenic spectrum of poliomyelitis viruses in different tissues. Poliomyelitis-virus strains after continual cultivation in one tissue showed increased pathogenicity for that tissue but greatly reduced pathogenicity for tissues to which they had earlier been

1. See *Lancet*, Sept. 12, 1953, p. 546.

adapted. Clearly this is a field of great importance for those seeking stable avirulent variants of poliomyelitis viruses for use in vaccines, and the phenomenon will repay careful investigation with all the virological, genetic, and serological techniques available.

G. BARSKI, V. MONACI, and M. ENDO (Paris) have recently reported that that most dispensable of human organs, the tonsil, provides a convenient source of fibroblasts for cultivating poliomyelitis virus in vitro, and these cells have been most useful for a study of the detailed histopathology of the virus lesion.

TH. FRANCIS, jun., and L. W. CHU (Ann Arbor, Michigan) found that poliomyelitis virus was adsorbed to tissue constituents of the grey matter of the brain of monkey and man. Other tissues of these animals or the same tissues from other animals did not absorb the virus. This " receptor-like " substance appears to be protein in nature and may prove a valuable object in the study of poliomyelitis-virus growth.

A. J. RHODES (Toronto) described the use of synthetic nutrient media in tissue cultures infected with poliomyelitis virus. Those who discussed his paper seemed curiously unimpressed with the advantages of having a medium of known chemical composition, but Rhodes produced sound theoretical reasons for his choice.

J. L. MELNICK, J. T. RIORDAN, E. C. CURNEN, and A. D. MACRAE (New Haven, Connecticut) found a number of unidentified pathogenic agents during their attempts to isolate poliomyelitis virus in tissue-culture; some of these may be new viruses, but there is always the possibility that an unidentified agent may be a weakly pathogenic variety of a known agent or a mixture of two known viruses.

A. SVEDMYR and L. KJELLEN (Stockholm) discussed their experiences with the complement-fixation reaction in poliomyelitis using antigens prepared from tissue-culture virus by improved techniques.

D. HORSTMANN and R. W. MCCOLLUM (New Haven, Connecticut) demonstrated the occurrence of viræmia during poliomyelitis and pointed out that the beneficial action of gamma-globulin in poliomyelitis is not necessarily due to its stopping the viræmia.

S. GARD (Stockholm) found that during the late stage of an epidemic of poliomyelitis quite a high proportion of infants and young children, but not adults, excreted virus. He assumed that the positive individuals represent a selection of persons not previously exposed to virus and suggested that the percentage of positives among the non-immunes rather than of the whole population should be taken as significant of the rate of dissemination of virus in the community. This, incidentally, may be one of the last epidemics in which isolation of poliomyelitis virus was made by inoculating monkeys.

OTHER VIRUSES

J. S. F. NIVEN, A. W. GLEDHILL, and G. W. A. DICK (London) showed the dual character of the ætiology of mouse hepatitis. *Eperythrozoön coccoides*, an organism with an unexpected ability to penetrate bacterial filters, was found to enhance greatly the pathogenic action of the mouse hepatitis virus and of a number of biologically related agents.

R. M. TAYLOR (Cairo) described the isolation of a number of viruses from human blood and mosquitoes in Egypt. He identified Coxsackie and West Nile encephalitis viruses and possible new agents.

There were some rather sensational discoveries reported under the heading " diseases of possible virus ætiology," but it seems likely that the ætiology of many of these conditions will remain in doubt for some time.

Symposia

In parallel with the congress, a number of symposia were organised by the Instituto Superiore di Sanita. In perhaps the most stimulating paper R. DULBECCO and M. VOGT (Pasadena, California) described their techniques for studying the growth of animal viruses. Previously workers with bacteriophages have enjoyed the advantages of being able to count the concentration of infective bacteriophage in a preparation by spreading it on a single suitably inoculated petri dish, and to measure by appropriate methods the yield of bacteriophage from a single cell. Now Dulbecco has adapted these techniques to the study of animal viruses grown in tissue culture. Animal viruses such as those of equine encephalomyelitis and poliomyelitis were found to produce plaques analogous to bacteriophage plaques, when spread on the surface of a thin layer of tissue-culture cells grown on glass. From such plaques it is possible to isolate pure " colonies " of virus and to envisage the carrying out of accurate genetic studies. Dulbecco also carried out kinetic studies of the growth of virus in suspensions of separate cells and in single cells, and he found that the release of virus from these cells was gradual over a long period of time, unlike the sudden release of bacteriophage from bacteria on lysis. Both from the point of view of what was already accomplished and from its future possibilities this was one of the most important contributions to the congress.

R. W. SCHLESINGER (New York) gave a most stimulating account of the multiplication of influenza virus. He was anxious to find some rational explanation for the enzymic action of influenza virus and saw in it some fundamental activity connected with multiplication rather than an accidental property of little practical value to the virus. He presented interesting results to show the variations in concentration of the enzyme substrate during the course of infection, and concluded, as Dulbecco had done, that the cells produced virus over quite a long period of time.

P. VON MAGNUS (Copenhagen) described his work with incomplete influenza virus, made in an attempt to answer the puzzling question whether incomplete virus is an immature developmental form or mature but defective virus. His exhaustive experiments covered almost every aspect of the phenomenon, and he presented reasoned accounts of the factors governing the appearance of incomplete virus. He emphasised the heterogeneity among incomplete virus particles; and GARD, as a result of his analyses of the lipid content of these virus forms, supported this strongly.

Apart from the communications there were numerous formal and informal scientific meetings associated with the congress. Thus the International Committee on Bacteriological Nomenclature decided that henceforth *Bacterium coli* should become *Escherichia coli*. The subcommittee on virus nomenclature were less fortunate: they agreed that Professor Gard should take the minutes, and this represented the major area of their agreement. Nevertheless the congress produced a great deal of informal agreements, friendships made and renewed, and collaborations established. Italy was in many ways an ideal country for the congress, and the friendliness and sunny temperament of the Italian and his climate soon communicated themselves to the delegates.

Perhaps the Italian motorist's method of indicating the direction he wished to go by driving straight at you may have stimulated morbid reflections on the half-life of the Italian pedestrian; the leisurely progress of Italian waiters may have set in motion a few doubts as to the true meaning of the word *subito*. Perhaps, too, scientists may have felt a little sad when they heard about the difficulties which a young Italian may have to overcome if he wishes to pursue a research career; scientists in this country are not accustomed today to hearing that young university workers may have to buy their own animals and apparatus if they wish to do research. But however they may have reacted to this or that aspect of Italian life, there were few delegates who left Rome without a deep impression of the beauty and majesty of a great city and a great civilisation.

PHYSIOLOGY

FROM A CORRESPONDENT

MOST people associate Montreal with McGill, and McGill with Osler. But Penfield, Collip, Meakins, Babkin, and Browne have also made Montreal a world medical centre, and Masson and Selye have attracted budding histologists and experimental endocrinologists from all over the world to the young Université de Montréal, which has become the French Canadian Sorbonne.

The 19th International Physiological Congress, held in Montreal between Aug. 31 and Sept. 4, went off with élan. The atmosphere of the city is unique. Although 75% of its population is of French Canadian descent, its strategic position as the gateway to Canada filters out many Europeans who come to settle in the country. In winter and in summer it is also a playground and business centre for Americans from New England and the East Coastal States. Its flavour is a mixture of French Canadian glamour, shrewdness, and finesse; of English Canada's adventurous foresight; and of American bustle and know-how. These attributes, and the peculiar saltiness common to all great ports, have made it the cosmopolitan centre of North America—and a gay one at that.

Some 3000 members and associate members from 48 countries, including a large contingent from the United Kingdom, registered for the congress, which was notable for the tremendous amount of work presented and for the overwhelming hospitality of the Canadians.

Dr. CHARLES BEST, co-discoverer of insulin, in a presidential address, opened the congress and also gave a display of verbal virtuosity in welcoming the members in six languages, including Gælic and Mohawk.

During the week, seven symposia were given in the Salle des Promotions of the Université de Montréal, while over 700 individual papers and 60 demonstrations were given at McGill. Buses shuttled between the granite-grey, ivy-walled, tree-shaded McGill campus and the barren yellowness of Montreal's modern university. McGill has the classic veneer of any Scots university and flows down the commanding slope of Mount Royal into the centre of the city. The Université de Montréal is built high on Mount Royal on the north-western slope of the mountain overlooking the suburbs. Its main building, a phallic tower, rears a corona high above the factory-modern classrooms and laboratory buildings which cluster around it.

When one got tired of symposia and papers or needed relief from the heat, there were lounges for talking or writing, an open-air buffet under the trees for food or beer in the garden of the Arctic Institute of North America. The entertainment was magnificently organised. All of 3000 guests were invited to cocktail or dinner parties given in the private homes of the hospitable medical community of the city. Gay, free-and-easy receptions were given to the congress by the Province of Quebec and by the City of Montreal, who gave two lavish evening parties in the chalet on top of Mount Royal. There were boat trips up and down the St. Lawrence, fun-fairs, a water ballet, and outings in the Laurentian Mountains. The wives went to fashion shows and on tours of Canadian industries, including a brewery, and were taken sight-seeing over Montreal by Trans Canada Airways.

At special convocations, honorary degrees were conferred on Prof. W. R. Hess, Sir Henry Dale, O.M., and Prof. E. Lundsgaard—all past-presidents—by McGill University. The Université de Montréal conferred degrees on Prof. E. D. Adrian, O.M., and Prof. L. Binet. Dr. W. W. Francis, director of McGill's Sir William Osler library, put on display the treasures of Osler's famous and unique historical collection, and the exhibit of early physiological books was particularly interesting.

Officials of the International Council of Scientific Unions, affiliated with UNESCO, seized the opportunity to convene a constituent general assembly for organising an International Union of Physiological Sciences; and they also arranged a Symposium on the Future and Limitations of Physiological Research, under the chairmanship of Professor Adrian.

The amount of work presented at this congress was tremendous, and much of it was clinical. The abstracts of communications were published in a 976-page book, weighing nearly two pounds and containing over 1000 communications. Besides the official meetings, demonstrations, and films, private group meetings were held for specialists in various subjects.

Ten Russian physiologists, headed by K. M. Bykov, attended the meeting. Everyone was pleased to see that they mingled more freely with the other delegates than they did at the Copenhagen congress in 1950. They were neurophysiologists, and in the main presented papers dealing with extensions of Pavlov's work. These were given in Russian, but they had brought with them translations of their communications in English and in French which were available to members of the congress. Perusal of these papers and the abstracts shows that a tremendous amount of extremely interesting work on conditioned reflexes is being done in Russia. Unfortunately, experiments and data are obscured by unnecessary polemics rélated to the deification of I. P. Pavlov, the conceptions of dialectic materialism, and the wickedness of Sherrington, Fulton, Magnus, and Liddell. It is a pity that in 1950 and 1953 we had only a small peek at a segment of Russian physiology. No doubt they consider Pavlovian neurophysiology their most important contribution, but it is getting rather tiresome to those of us interested in other aspects of health and disease. It would be nice if, in 1956, we were allowed a peek at other aspects of Russian physiology, such as studies on shock, hæmorrhage, blood coagulation, geriatrics, and the physiology of cold—fields of endeavour in which Russian physiology presumably excels.

The symposia on Insulin, Hæmodynamics in Small Vessels, Cardiac and Pulmonary Reflexes, Postural Mechanisms, Physiology of Learning, Formation of Thyroid Hormone, and the Physiology of the Cold dealt in the main with reviews of published observations. Many of the individual communications were grouped together round specific subjects. In some fields there have been tremendous advances or clarification in the past three years. Particularly impressive were the clarification of problems of blood coagulation and studies of the hyperglycæmic hormone from the pancreas—glucagon.

Elements in Wall of Blood-vessels

A. C. BURTON (Ontario) said that histological study shows four clearly defined types of tissue in the wall of blood-vessels—namely, the endothelial lining, the various elastic-tissue layers, the smooth muscle, and the fibrous connective tissue which forms an outer tunic and penetrates between the last two tissues. These elements are found in different proportions in the different types of blood-vessels, and in the true capillaries only the first seems to be present. Theoretical analysis with the aid of the classical law of LaPlace, and indirect experimental evidence using the flow-pressure relations in vascular beds, has given us a new appreciation of the rôle of each of these elements and their coöperation in the control of blood-flow. Semiquantitative estimates of the magnitude of the tensions developed in these tissues under the blood-pressure and under vasomotor tone are now possible.

Physiology and Pathology of Cerebral Cortex

K. M. BYKOV (Leningrad) stated that the three principles of I. P. Pavlov's theory are determinism, unity of analysis and synthesis, and unity of function and structure. The physiologist and psychologist who follows Pavlov's teaching

wages a relentless ideological struggle against representatives of metaphysical conceptions in physiology and psychology who, to date, are preaching dualism in the characteristics of processes taking place in the brain, contrasting the nervous process with the psychological, tearing it away from structure, denying to the nervous factor its main and determining rôle in all vegetative somatic processes, and attempting to restore an antiscientific subjective method of investigation. Freud's idealistic conception, which has nothing in common with a scientific analysis of a normal or pathological disturbance of the activity of the functions of the central nervous system, is alien to the real physiology of the brain.

Biochemical Observations on Inflammation in Rats

V. W. ADAMKIEWICZ (Montreal) said that a method was recently devised for studying inflammation in small laboratory animals. This method—the "granuloma pouch" technique—is simple, and permits initiation of inflammation in an exactly reproducible and quantitative manner and production of large amounts of exudate which are well delimited by a considerable layer of granuloma tissue. The exudate can be accurately measured and the granuloma weighed. This technique does not cause much systemic stress since it is well tolerated even by hypophysectomised rats. The exudate shows a high degree of constancy in its main chemical constituents within any experimental group hitherto investigated. Using this technique, he studied the changes in various chemical components (proteins, sugars, fat, Na, K, Cl, P) in the exudate and granuloma when the course of inflammation was modified by: hypophysectomy, adrenalectomy, treatment with prophlogistic hormones (corticotrophin, hydrocortisone, cortisone), and treatment with antiphlogistic hormones (deoxycortone acetate, somatotrophic hormone). Modifications in sugar and fat content were detected in the various exudates collected on the 14th day of inflammation. Studies were also made on the permeability of the granuloma wall to ions (Na, K, Cl, P) and water during different stages of inflammation. It was found that the granuloma wall is readily permeable to the ions. Finally, an attempt was made to show the triphasic nature of the response of the body to local injury. The biochemical criteria used for this are the changes in concentration of Cl, P, Na, K, and the changes in water-clearances of connective tissue undergoing inflammation. The triphasic nature of this "local adaptation syndrome" resembles that of the general adaptation syndrome.

Incoagulable Afibrinogenæmic Blood

B. ALEXANDER, R. GOLDSTEIN, ANNE G. LEBOLLOC'H, L. K. DIAMOND, and W. BORGES (Boston, Mass.) reported that studies on incoagulable blood from three subjects with congenital afibrinogenæmia have yielded information concerning basic aspects of the coagulation sequence independent of the fibrinogen-fibrin system. Immunochemical tests revealed at most only traces, and certainly less than 1% of normal, of fibrinogen or fibrinogen-like material in the plasma. After the blood is shed and exposed to glass, the earliest detectable changes, beginning within a few minutes, are morphologic alteration in the platelets and their progressive agglutination and lysis. Almost in parallel, plasma anti-hæmophilic activity, originally normal, declines and practically disappears. Also within minutes, Spca evolves from its precursor in normal manner. Prothrombin disappears at normal velocity, or slightly faster than normal. Ac-globulin also disappears at normal rate. The Ac-globulin of afibrinogenæmic oxalated plasma is convertible to the active serum form by addition of thrombin. Thrombin addition to the plasma also induces platelet agglutination, but this does not occur when thrombin is mixed with platelets alone. Anti-thrombic activity of afibrinogenæmic plasma is normal. The co-factor of heparin antithrombin effect was demonstrable. Quantitative data relating the fibrinogen concentration with the prothrombin-time were obtained. It may be concluded with reasonable certainty that conversion of fibrinogen to fibrin plays no rôle in the changes described above.

Contractility of Human Uterus

H. ALVAREZ and R. CALDEYRO-BARCIA (Montevideo) described studies of the pressure exerted by the uterine muscle on its contents, by recording the pressure of the amniotic fluid. The coördination of the contraction is analysed by recording the intramuscular pressure in several parts of the uterus by means of 4 microballoons inserted in the mass of the muscle and connected with a capacity manometer. During pregnancy localised contractions are produced which cause small and rhythmical oscillations in the amniotic pressure. Sporadically a general contraction of the whole uterus appears. In the days preceding labour the frequency of the generalised contractions increases progressively, while the number of the localised contractions decreases. In normal labour there are generalised contractions which start near the uterine end of one of the fallopian tubes, and spread very rapidly inwards and downwards (descending propagation); all parts of the uterus contract with good synchronisation. The upper parts of the uterus contract stronger and longer than the lower parts. There are 3–5 contractions per 10 minutes. In the third stage of labour the record of the placental blood-pressure shows that the contractions have the same characteristics as in the first and second stages, though they are absolutely painless. In the hours that follow labour, there is a progressive decrease in the frequency of the contractions, and also in the propagation speed of the contraction wave. In abnormal labours the following are observed: (1) weak contractions, (2) bad coördination, with (*a*) lack of fundal dominance, (*b*) ascendent-propagation of the contractions, (*c*) lack of synchronisation between the different parts, (*d*) localised contractions; and (3) hypertonus produced by (*a*) over-distension of the uterus, (*b*) asynchronism, (*c*) high frequency of contractions, (*d*) premature separation of the placenta.

Physiological Responses to Aldrin

W. L. BALL, K. KAY, M. CREVIER, and J. W. SINCLAIR (Ottawa) said that the possible ill effects on human health of the recent tremendous increase in the use of chlorinated hydrocarbon insecticides is causing concern. Aldrin was selected for investigation because it is the most toxic of the common insecticides of this type. In the preliminary stages of the work it was demonstrated that it has growth-stimulating and œstrus-inhibiting factors and causes organ enlargement and pathological changes. A lowering of the basal metabolism and an increase in the serum-esterase activity were observed. All these effects occurred at dietary levels which could result from the persistence of aldrin on foodstuffs. The rise in serum-esterase caused by aldrin suggested it might antagonise the effect of the cholinesterase inhibitors. The pre-treatment of rats with aldrin produces fivefold protection against the organic phosphate insecticide, parathion.

Sodium Excretion with Cardiac Disease

A. C. BARGER, R. S. ROSS, H. L. PRICE, G. M. WILSON, and L. BROOKS (Boston, Mass.) investigated the ability to excrete an infused load of isotonic sodium chloride in dogs with various experimentally produced valvular lesions of the heart. In these animals the excretion of sodium chloride and water during the 8 hours immediately following a standard infusion is reduced to as low as 1% of preoperative control values. Delayed excretion of sodium loads accompanies changes of cardiac function which produce little or no elevation of resting venous pressure, and no significant change in the ratio of infused sodium load to total exchangeable body-sodium was found.

Carbohydrate Metabolism in Spinal-cord Injury

J. M. BERNSOHN, BROWN, and J. R. FINKLE (Hines and Chicago, Illinois), studying the regulatory defects occurring in spinal-cord injury, determined glucose-tolerance curves in 86 patients with spinal-cord lesions at various levels, and of a minimum of 15 months' duration. The results indicate that while no differences in the fasting level were apparent, patients with spinal-cord lesions in the cervical region exhibited sustained high curves. Statistical analysis of the results indicated that after the 30-minute period the values obtained in the cervical cases were all significantly higher than the other comparable values. While the mechanism of this dysregulation in carbohydrate metabolism is not conclusively demonstrated by the data, the results support the concept that descending fibres from higher centres are interrupted, and that this interruption may cause a dysfunction in the homœostatic mechanism involving the control of blood-glucose levels.

Goitre Prophylaxis with Iodised Salt

B. E. BRUSH (Detroit, Michigan) said that in 1923 a survey of the school-children in four Michigan counties, made by

the State health department and the State medical society, revealed that of 65,537 students 38·6% had goitre. At the time of the goitre survey, the amount of iodine in the soil and drinking-water at various points throughout these counties was studied. A close and constant relationship was noted in each instance, in that the prevalence of goitre was in inverse proportion to the available iodine. Following this, an extensive programme was begun to advertise the importance of iodised salt, which was placed on the market in 1924. Subsequent surveys showed a remarkable decrease in the prevalence of goitre in these same areas. In 1928 the over-all prevalence was 9·9% and in 1951 only 1·4%. A record was made in these subsequent surveys of the number using iodised salt, those not using it, and those who used it part of the time. As was to be expected, there was a marked decrease in goitre among those who had used iodised salt regularly and no decrease in those not using it.

Metabolic Effects of Pituitary Growth-hormone

A. CARBALLEIRA, H. ELRICK, K. R. MACKENZIE, and J. S. L. BROWNE (Montreal) said that purified preparations of pituitary growth-hormone have been ineffective in man, in contrast to the striking metabolic effects produced in laboratory animals. As these preparations have been administered either subcutaneously or intramuscularly, with the possibility of inactivation by tissue enzymes, the intravenous route was chosen in these experiments. Under the influence of growth-hormone the rate of disappearance of injected amino-acids from the blood was accelerated. Urinary amino-nitrogen excretion was reduced in the growth-hormone experiments. The blood non-protein-nitrogen levels did not increase, suggesting an incorporation of the amino-acids into the tissues. A slight and transient rise in blood-sugar levels was observed within the first 2 hours after the growth-hormone was administered. The ketonæmia of fasting was also increased when growth-hormone was used. Serum-phosphorus, alkaline phosphatase, and urinary phosphorus showed no consistent change. Eosinopenia was observed with a dose of 3 mg. per kg. body-weight, but no significant changes occurred with the lower doses when compared with the control experiment. Apart from nausea and vomiting, which occurred in two subjects receiving the 3 mg. per kg. dose, there were no untoward effects from the administration of this preparation of growth-hormone.

Glucagon

C. DE DUVE and C. A. VUYLSTEKE (Louvain, Belgium) said that glucagon (hyperglycæmic-glycogenolytic factor of the pancreas) has been isolated with approximately tenfold purification from alkali-inactivated insulin but has never been successfully separated from the native hormone. In order to follow accurately the results of chemical fractionations, the assay on isolated rabbit-liver slices developed by Sutherland and de Duve has been improved, mainly by the inclusion of a reference standard in the test and by the use of logarithmically spaced doses, rendering the results amenable to statistical analysis. By means of sodium-chloride fractionation at pH 1·4, followed by fractional crystallisation, it has been possible to isolate preparations which have about ten times the specific activity of the purest samples obtained by Sutherland and co-workers. Unfortunately, the yields are small.

Toxicity of Serum and Urine

R. FISCHER (Regina, Saskatchewan) has tested the serum and urine of acute schizophrenics on larvæ of *Xenopus lævis* bred at 20°C; 10–20 ml. per litre of serum or 25–50 ml. per litre of urine, added to the water-milieu of 14-day-old larvæ, caused a significantly higher mortality than the serum and urine of healthy controls in the same dilutions. Spontaneous remission or successful treatments gradually diminish the toxicity to normal values. Whether the toxicity of acute schizophrenic serum may be regarded as a consequence of the schizophrenic stress situation or might be in some way involved in the ætiology of schizophrenic psychopathology is still uncertain.

Physiological Secretion of Glucagon

P. P. FOA, HARRIET R. WEINSTEIN, E. B. MAGID, M. D. GLASSMAN, and J. A. SMITH (Chicago) investigated the hypothesis that glucagon is a second hormone normally secreted by the pancreas, by cross-circulation of the pancreato-duodenal vein of a donor dog with a femoral vein of a recipient dog. Injection of insulin in the donor dog was followed by hyperglycæmia in the recipient dog, suggesting that the donor dog secreted glucagon in response to insulin hypoglycæmia. The injection of glucagon into the donor dog was followed by hypoglycæmia in the other dog, suggesting that the pancreas of the donor dog secreted insulin in response to glucagon hyperglycæmia. These workers believe that secretion of glucagon is regulated by the blood-sugar level. Their data indicate that pituitary growth-hormone causes hyperglycæmia by stimulating the secretion of glucagon. This may explain, in part, the diabetogenic action of growth-hormone.

Furadantin in Urinary Proteus Infections

C. E. FRIEDGOOD and D. B. RIPSTEIN (New York) remarked that urinary-tract infections due to proteus have been completely refractory to all forms of therapy. 'Furadantin,' a new broad-spectrum antibacterial nitrofuran, has been found to be effective against proteus. A group of 92 patients with pyuria due to either cystitis or pyelonephritis were selected in whom the infecting organism was proteus. They had all had intensive antibiotic therapy which was unsuccessful. The patients were then placed on divided oral furadantin therapy four times a day. The acute cases showed a remarkable response to the drug, with 90% cures within one week. The chronic group of cases had a lower cure-rate of approximately 65% sterile urine cultures. The only side-reaction was nausea. There was no evidence of sensitisation.

Liver Factor in Cerebral Metabolism

A. J. GEIGER and J. DOBKIN (Jerusalem) reported that the brain when perfused with "simplified blood" consisting of well-washed erythrocytes in albumin-Ringer solution ceased to take up glucose and to oxidise carbohydrates, but regained these functions on addition of a liver extract. After about 45 minutes of perfusion with "simplified blood" when the brain ceased to take up glucose, an endogenous substance, presumably not a carbohydrate, was utilised. During an hour's perfusion, the non-protein nitrogen in the brain increased from 60 to 160 mg. %, the amino-N remaining around 40 mg. %. After an hour of perfusion, mannose is easily taken up by the brain, but not glucose. 40 minutes of perfusion usually reduced the glucose content of the brain to 30% of the blood-glucose concentration, suggesting that all the glucose was in the extracellular spaces. During longer perfusion a further reduction of this relationship indicated the impermeability of the whole brain to glucose. Lactic acid accumulated in the brain up to 300 mg. %. Inclusion of the liver in the perfusion normalised the brain-blood glucose relationship and reduced the lactate concentration. Glucosamine added to the "simplified blood" was taken up by the brain at a rate of 3–4 mg. per 100 g. per min. at a concentration difference of 100 mg., even 60 min. after the start of perfusion. Part of the glucosamine was esterified in the brain. Its concentration in the blood diminished progressively, indicating utilisation in the brain immediately after the addition of glucosamine. Lactate diminished but increased again as more glucosamine was taken up.

Myocardial Metabolism

W. T. GOODALE (Boston, Mass.), R. E. OLSON (Pittsburg), and D. B. HACKEL (Cleveland, Ohio) discussed contrasting patterns of myocardial metabolism in diabetes, in cardiac failure, and after insulin administration in man. Previously reported coronary catheterisation studies in dogs and man have shown excellent correlation between myocardial respiratory quotient and myocardial carbohydrate utilisation. In mild diabetes, the fasting R.Q. was 0·7 with markedly reduced or negligible myocardial glucose, lactate, and pyruvate extractions, despite high circulating levels. The glucose utilisation threshold was elevated to 95–260 mg. per 100 ml. Insulin restored this threshold to normal or below, with marked rises in R.Q. to 1·1–1·2 and with normal or high utilisation of all three metabolites. These findings tended to confirm the rôle of insulin in converting carbohydrate to fat. Although diabetes caused defective myocardial carbohydrate utilisation, there was no interference with mechanical work or efficiency. Patients with cardiac failure due to valvular disease, with reduced effective work and efficiency, showed normal lactate and pyruvate and superabundant myocardial glucose extractions, relative to both arterial substrate levels and simultaneous oxygen extraction. This unaccountable glucose extraction for non-oxidative purposes is also seen in myocardial tissue slices and other

preparations with limited survival-time. There is no evidence for anaerobic glucose metabolism nor for myocardial lactate production in the failing heart in vivo. Cardiac failure of this variety thus cannot be related to myocardial anoxia nor to a failure in energy production, but rather to a failure of conversion of chemical energy to effective mechanical work. Paradoxically, the diabetic heart, with limited production of energy from carbohydrate even in mild cases, remains mechanically efficient with energy derived almost entirely from other substrates such as fat.

Photography of Pelvic Organs

H. S. GUTERMAN and M. R. COHEN (Chicago) described a pelvic photoscope, developed by Dr. Guterman, for the visualisation and photography of the surfaces of the structures of reproduction in the human female. Colour photographs can be taken of anatomical changes observed in these structures during the menstrual cycle, and it is possible to correlate anatomical, physiological, and endocrinological changes in the same individual during a given time.

Metachromatic Activity of Urine

L. B. JAQUES, E. NAPKE, and S. W. LEVY (Saskatoon, Saskatchewan) had injected heparin in animals and man, and measured the metachromatic activity of the urine. By quantitative precipitation of urine with benzidine, metachromatic activity equivalent to 2–13% of the heparin injected was recovered. This contained an excretion product of heparin, uroheparin, with metachromatic activity and low antithrombic activity. Following the injection of heparin, depending on the dose, the anticoagulant may be (1) destroyed by heparinase, (2) degraded to uroheparin, (3) excreted unchanged. In the case of (2) and (3) metachromatic activity is found in the urine.

Early Ontogenesis of Higher Nervous Activity

N. I. KASATKIN (Moscow) said that an important way of investigating higher nervous activity in man is the study of its development in a child, beginning at the earliest age. This method, together with the clinical method, is the most fruitful and makes it possible to follow the highly complex process of development of the main mechanisms of higher nervous activity, starting with its most elementary forms. The advantage of studying the higher nervous activity during the first stages of the development of a child lies primarily in the fact that a newborn baby possesses only a limited fund of unconditioned activities. Subsequently, on the basis of unconditioned reflexes, very complex systems of conditioned reflexes are formed in a child, which in their turn influence and modify the unconditioned activity. An experimental investigation of the development of the higher nervous activity in a child made necessary the elaboration of a method for its study. A method of motor-food, protective, and orientative conditioned reflexes has been worked out, on the basis of which conditioned reflexes from all analysers may be formed in a child during the first months of its life. The appearance of the first conditioned reflexes indicates unambiguously that the activity of the cerebral cortex in a child has begun. The formation of early conditioned reflexes obeys definite laws. The first such reflexes to appear are noticed about the middle of the first month of life; the order in which conditioned reflexes appear depends on the analyser within whose limits they are formed; until the end of the first month of life conditioned reflexes, if they appear, are distinguished by their extreme instability. The second month of the life of a child is an age when conditioned reflexes may be created within the limits of all main analysers. A conditioned reflex, in the process of its formation, passes through several stages. In children born prematurely by one or two months, conditioned reflexes to auditory stimulation may be formed at the same age as in children born normally. Ontogenetical investigation of the higher nervous activity of a child makes it possible to elucidate the most important laws governing the early ages of its development. These laws, established by a strictly objective method, must form a sound physiological basis for the care and upbringing of small children.

Cholesterol Metabolism and Diet

A. KEYS (Minneapolis) said that studies on physically healthy men on controlled experimental diets show that: (1) addition or removal of dietary cholesterol is without effect on serum-cholesterol; (2) serum-cholesterol is decreased in severe calorie undernutrition; (3) serum-cholesterol increases during active weight gain, when only carbohydrate is added to the diet to produce overnutrition; (4) in calorie balance, change in the proportion of calories supplied by dietary fats produces parallel changes in the total serum-cholesterol concentration in a few days, a new plateau being established in a few weeks. Both vegetable and animal fats are effective. Studies on population samples of physically healthy men habitually on diets differing in the proportion of calories supplied by fats in England, Spain, Italy, and the United States show:

1. There is no important influence of dietary fat level on serum-cholesterol from age 18 to the early 30s.

2. There is an increasingly marked effect from the early 30s into middle age. 50-year-old men on high-fat diet, as in the U.S.A., have a mean serum-cholesterol level some 50 mg. per 100 ml. higher than men of the same age on diets where the dietary fats provide 20–25% of the total calories, as in the general populations of Italy and Spain. In upper-class Spaniards on high-fat diets the serum-cholesterol is like that in the U.S.A.

3. These population differences are not merely reflections of total calories or relative obesity. The Italians were as fat as the American men and were fatter than the Englishmen studied. But calorie inadequacy combined with a moderately low-fat diet, as seen in poor Spaniards, was associated with the lowest cholesterol values seen in middle age.

4. There was no evidence for an effect of dietary cholesterol in these population comparisons. This agrees with the finding in the U.S.A. that the individual serum-cholesterol value is not correlated with habitual cholesterol intake of the individual.

Cortical Activities

P. S. KUPALOV (Leningrad) said that the method of conditioned reflexes permits a strictly objective physiological study of simple nervous activity as well as of the most complex higher nervous activity which constitutes the normal natural behaviour of animals. The position of the animal in the room becomes a positive conditioned stimulus if at the moment when the animal occupies a definite place in the room a stimulus is applied which has already become a conditioned food stimulus. After this when the experiment is repeated, the animal actively and spontaneously places itself in this very particular place of the room and all its motor activity becomes strictly determined. Therefore there exist spatial conditioned stimuli. Experimental neuroses can be produced even in such conditions when the behaviour of the animal is absolutely natural and the freedom of its motor activity is not hindered. By combining different stimuli from the environment, the motor activity of the animal, and the spatial conditioned stimuli it is possible to work out a complicated normal behaviour of the animal representing in itself the unification of several conditioned reflexes into a single nervous activity. Such complex conditioned reflexes have been designated "situation-conditioned reflexes."

Drip-tube Feeding in Nephrosis

G. T. LEWIS and J. J. GRIFFITTS (Miami, Florida) discussed the effect of drip-tube feeding on patients with nephrosis. The material is administered by constant drip through a plastic catheter inserted through the nose into the stomach or duodenum. 3000 ml. can be given in each 24-hour period, and this provides protein split products equivalent to 195 g. of protein and approximately 3000 calories. In nearly every instance, œdema has disappeared within a few days following the initiation of the régime and has not returned as long as the conditions were adhered to. No claim is made that the conditions responsible for the nephrotic state have been corrected, but with this régime it is possible to maintain the nephrotic patient indefinitely in a good nutritive state and œdema-free. During this period, Nature has an opportunity to correct the defect.

Blood Coagulation

JESSICA LEWIS (Chapel Hill, North Carolina) discussed prothrombin, proaccelerin, and proconvertin in blood coagulation. Methods for the isolation of prothrombin, proconvertin, and proaccelerin from human plasma have been developed, and the interaction of these materials in

the presence of tissue thromboplastin and calcium studied. The methods employed in this study of isolated prothrombin, proaccelerin, and proconvertin are also applicable to clinical instances of deficiencies of these coagulation factors. Thus the cause of a prolongation of the one-stage "prothrombin-time" (Quick test) can be readily identified if due to a deficiency of any of the three factors alone or in combination. This is illustrated by representative tests on (*a*) congenital hypoproaccelerinæmia, (*b*) congenital hypoproconvertinæmia, and (*c*) mixed deficiencies associated with various clinical disease entities.

Ileostomal Steatorrhœa

D. A. MACFADYEN (Chicago) had obtained data from 4 subjects with surgical ileostomy on a standard analysed diet for periods of four days each. Fifteen months after a prior investigation under the same dietary and analytical conditions, one subject developed steatorrhœa, with excretion of 90–110 g. of fat from an intake of 135 g. The data show that calcium and phosphorus excretions were normal, and the same on the occasion of steatorrhœa as on the earlier occasion when there was no steatorrhœa. The increase in fatty-acid excretion, about 45% of the total lipid excreted, was accompanied by slight increases in excretion of potassium and magnesium and by a marked increase in sodium excretion, from the usual amount of 50–75 m.eq. a day to 110–150 m.eq. a day. The conclusion was drawn that, under the conditions of normal gastric secretion of hydrochloric acid and normal digestion of proteins, the digestion of fat in the small intestine is accompanied, after absorption of calcium chloride, by formation of sodium soaps and calcium phosphate; sodium being provided as bicarbonate from secretions into the intestinal lumen, according to the reaction $HA + NaHCO_3 = NaA + H_2CO_3$.

Splanchnic Carbohydrate Balance

J. D. MYERS, R. F. KIBLER, W. J. TAYLOR, L. W. HAMRICK, F. L. ENGEL, and E. WERK (Durham, North Carolina) said that the technique of hepatic venous catheterisation has allowed the measurement, in unanæsthetised man, of hepatic venous glucose concentration. Thus the arterial-hepatic venous glucose difference may be determined and, when multiplied by the corresponding hepatic blood-flow, which in turn is estimated by bromsulphalein clearance, the splanchnic glucose balance is obtained. In 56 control, fasting human subjects, the arterial-hepatic venous glucose difference was always negative and the splanchnic glucose production averaged 64 ± 3·1 mg. per minute per sq. m. of body-surface. Adrenaline, pancreatic hyperglycæmic factor, and probably growth-hormone all produce similar and prompt outpourings of glucose from the splanchnic area with the production of hyperglycæmia. Parenteral glucose abolishes splanchnic glucose output; this effect is simulated by the response to small doses of insulin.

Hypothermia

C. B. RIPSTEIN, C. E. FRIEDGOOD, and N. SOLOMON (Brooklyn, New York) discussed hypothermia in cardiac surgery. The production and maintenance of hypothermia has several applications in surgery. At low body-temperature the metabolic needs of tissue are greatly reduced and the heart can be excluded from the circulation for fairly long periods without producing irreversible brain or cardiac damage. The production of a controlled drop in temperature is beneficial in hyperthermia accompanying severe sepsis, and the refrigeration technique has also been used to control intractable pain and to retard the growth of certain tumours. Recent investigation has revealed that certain anti-histamine drugs exert a thermoregulatory effect in warm-blooded animals. One of these is dimethylaminopropyl-N-chlorophenothiazine HCl ('Chlorpromazine'). A technique of producing hypothermia has been evolved using chlorpromazine in conjunction with refrigeration blankets and cooling of the inspired air. With this method, body-temperature can be lowered to 75–80° within 30–60 minutes, and the venæ cavæ can be clamped long enough to open the right atrium and close a septal defect.

Apocrine Sweat-gland

W. B. SHELLY and H. J. HURLEY (Philadelphia) said that there is a paucity of physiological data concerning the apocrine sweat-gland, in sharp contrast to the enormous body of knowledge surrounding the eccrine sweat-gland. Recent experimental studies by them have indicated that the apocrine sweat-gland activity may be divided into two phases: apocrine sweat secretion and apocrine sweating. Ordinarily apocrine sweating is produced by emotional stimuli, but it may be readily induced by pharmacological measures (local or systemic adrenaline) or mechanical stimuli (stroking, local pressure). Unlike the eccrine gland there is no response to acetylcholine and no inhibition by atropine. In view of the fact that appropriate stimuli only empty the tiny apocrine gland, and do not prompt any further secretion, the quantities of apocrine sweat which may appear on the skin at any given time are minute.

Crystalline Glucagon

A. STAUB, L. SINN, and O. K. BEHRENS (Indianapolis) remarked that the hyperglycæmic activity first observable in certain pancreatic extracts and later found to accompany some insulin preparations has been termed "glucagon" by Murlin. Recently they have been successful in isolating a unique crystalline substance from certain pancreatic materials. The crystalline glucagon is unique in its high hyperglycæmic activity: 0·1 µg. per kg. administered intravenously to anæsthetised cats is sufficient to give a 30 mg. rise in blood-sugar. The properties of the crystals are sharply differentiated from those of insulin. Crystallisation is in the isometric system, the crystals appearing as well-defined dodecahedra. Zinc is essentially absent. Sulphur is present only to the extent of 0·6% and is accounted for largely by methionine. Thus, glucagon contains little or no cystine—an important component of insulin.

Nickel Metabolism

F. W. SUNDERMAN and J. F. KINCAID (Philadelphia) discussed nickel metabolism following exposure to nickel carbonyl. The concentrations of nickel in the blood and urine have been estimated in normal subjects and in individuals accidentally exposed to the fumes of nickel carbonyl. Administration of 2, 3-dithiopropanol to critically ill subjects greatly increased the excretion of nickel in the urine. For the prevention of acute poisoning, the concentration of nickel carbonyl in air should be less than 3 parts per million for a period of less than 30 minutes.

Biochemical Abnormalities in Brain

D. B. TOWER (Montreal) discussed biochemical abnormalities in epileptogenic cerebral cortex. It has been found that slices of epileptogenic cortex (sampled at operation on patients for focal cortical seizures), when incubated in bicarbonate-Ringer medium containing glucose and eserine, fail to show the increase in their content of bound acetylcholine (ACh) observed in "normal" slices under these experimental conditions. This defect in ACh metabolism can be reproduced experimentally in slices of cortex from animals in which seizures have been induced by administration of methionine sulphoximine. In none of these cases is there significant deviation from normal in production of free ACh. Addition of glutamine or asparagine (10 mM) to the incubation medium has been found to correct the impairment of ACh binding in each instance, but has no effect on ACh metabolism in normal slices. When slices of cortex are incubated under conditions promoting normal ACh metabolism both the glutamine and glutamic acid content of the slices increase during incubation with no loss of either to the medium. With slices of epileptogenic cortex (human or animal) and with slices incubated under lowered oxygen tension, the glutamic acid content of the slices fails to increase and glutamine may be lost to the medium during incubation. The addition of adenosine triphosphate (3 mM) or asparagine (10 mM) to the incubation medium under these circumstances will correct the defects in glutamine and glutamic acid metabolism.

Darmstoff

W. VOGT (Frankfurt, Germany) discussed *Darmstoff*—a smooth-muscle-stimulating biogenic organic compound. It was always found in the wall of the small intestine of all species under investigation, also in the stomach and the large intestine, but hardly at all in skeletal muscle. It stimulates the intestine, uterus, and bladder. The action is not inhibited by atropine or ganglionic blockers. *Darmstoff* is an acid, which in free form is only slightly soluble in water but is readily soluble in many organic solvents. Since it is not destroyed by trypsin there is no indication of a peptidic structure. By its acidic behaviour *Darmstoff* can be distinguished from choline, histamine, and enteramine. Bradykinin, kallidin, and substance P are different from *Darmstoff* as regards

their being destroyed by trypsin. Moreover, substance P is markedly basic in nature (according to their recent investigations). The only substance being an acid like *Darmstoff* is prostaglandin. For the moment it is not known whether these two substances are related.

Experimental Hypertension

G. E. WAKERLIN (Chicago) discussed treatment of experimental hypertension with renin and antirenin. Chronic experimental renal hypertension in dogs has been successfully treated with crude and semi-purified hog renins, and chronic experimental renal hypertension in dogs has been prevented by prophylaxis with crude and semi-purified hog renins. These therapeutic and prophylactic effects are well-correlated with the antirenin titre. This evidence of antirenin (or an antibody to a protein closely related to renin) as the mechanism of the antihypertensive effect of hog renin constitutes support for the primary rôle of renin (or some closely related protein) in the pathogenesis of experimental renal hypertension. Spontaneous (essential ?) hypertension in the dog has been successfully treated with semi-purified hog renin, the antihypertensive effect being well-correlated with the antirenin titre. Obviously, these findings are good evidence that this hypertension is on a renal, renin basis. Since antirenin to hog renin does not neutralise monkey and human renins, studies aimed at altering the antigenicity of hog renin, so that the antirenin which it produces will neutralise monkey and human renin, are under way. In addition antirenin to human renin is being prepared in goats and dogs, in order to study the possible pathogenetic rôle of the kidney in essential hypertension.

Osmotic Pressure of Blood in Renal Papilla

H. WIRZ (Basle) said that the kidney of the golden hamster (*Mesocricetus auratus*) shows a long and thin papilla extending some millimetres beyond the hilus into the ureter. This part of the papilla can be exposed in vivo by dissecting the ureter and part of the renal pelvis. A quartz capillary, diameter 10–15 μ, was inserted in one of the papillary blood-vessels, and small samples of blood (0·2–1 μg.) were withdrawn. Immediately afterwards, equally small samples of urine were collected from the tip of the papilla. The freezing-points of both blood and urine were determined by a micro-cryoscopic method. Urine concentrations ranged from 0·30 osmol. per litre up to 0·62 osmol. per litre. The osmotic pressure of the capillary blood was either the same or, at most, 0·03 osmol. per litre higher than that of the corresponding urine. This indicates that the whole of the extracellular fluid in the papilla is strongly hypertonic when the kidney produces a hypertonic urine. The results give substantial support to the theory, advanced by Wirz, Hargitay, and Huhn, that a hairpin countercurrent system provided by the loop of Henle is involved in the process of concentrating the urine.

Special Articles

POLIOMYELITIS IN DENMARK

IMPRESSIONS FROM BLEGDAM HOSPITAL, COPENHAGEN

C. A. PALLIS

M.A., B.M. Oxfd, M.R.C.P.

SENIOR NEUROLOGICAL REGISTRAR, CARDIFF ROYAL INFIRMARY

THE 1952 poliomyelitis epidemic in Denmark, in which respiratory complications were prominent, has attracted much attention in this country; and many have visited Blegdam Hospital, Copenhagen, where Lassen [1] introduced the treatment of respiratory insufficiency by early tracheotomy with insertion of a tightly fitting rubber cuff tube, combined with bag ventilation, repeated aspiration and bronchoscopy, postural drainage, and the use of a stomach-tube.

At this hospital there remain a residue of "respiratory cripples," who provide dramatic proof of the severity of the outbreak. In comparing the relative severity of different outbreaks of poliomyelitis, the number of cases requiring assistance with respiration in the acute stage is often misleading, since this gives no guide to the duration of the respiratory insufficiency. A more precise guide might be obtained from the number of patients still requiring artificial respiration at various intervals after the acute illness; and this number would also give some idea of the amount of respiratory assistance required. Such figures are available from Blegdam Hospital.

WARD IMPRESSIONS

At this hospital chronic "respiratory" cases are nursed in a single block, in small wards with 3–8 beds. Patients are transferred from isolation cubicles to this "chronic" block once the diagnosis is firmly established and the acute phase of the illness is over. (The present policy is to perform tracheotomy, if judged necessary, while the patient is still in the isolation block; but at the height of the epidemic, when over 40 cases were being admitted daily, administrative niceties had to be waived and tracheotomy done wherever convenient.) The patients usually remain in the "respiratory block" for several months. In this block some patients are more or less ambulant while others are totally tetraplegic; but all require some help with breathing. When the patients are no longer in need of such help they are moved to other parts of the hospital.

The wards with chronic "respiratory" cases are a remarkable sight. One is immediately struck by the fact that, by day at least, they seem to contain fully as many auxiliaries as patients. The buildings are modern, however; and nurses, relays of "ventilating" students, and physiotherapists do not seem to get in each other's way. To each is assigned a precise function, and things proceed methodically and with the quiet efficiency of a well-established routine. There is a constant background noise from the asynchronous clicking and sighing of mechanical positive-pressure respirators.

In the acute stages of the disease a special nurse was detailed to each patient, but now each nurse usually copes with two, or sometimes three, patients. One of her main duties is to deal with the secretions that may accumulate in the larger bronchi. The patients themselves usually become quickly aware of these and often localise them with remarkable accuracy. Whether a rhonchus is palpable or not, the nurse vigorously pummels the appropriate part of the chest and immediately passes a suction-catheter through the endotracheal tube or silver cannula. The patients do not seem to mind this; and impressive amounts of secretion, that cannot be coughed up, are disposed of in this way. This measure may have to be repeated up to once an hour. In the larger wards at least, one is sure always to see this being applied to some patient or other.

The nurse is often one of the first to recognise impaired expansion of one part of the lung; and this is immediately reported, if necessary verified radiographically, and dealt with. Anyone who has tried to diagnose pulmonary collapse early, when the patient is being nursed in a tank respirator, or who has struggled with the problem of trying to examine radiographically such a patient (often capable, at most, of only a minute or so of spontaneous breathing) will appreciate how infinitely easier is this investigation when the patient is "accessible" and when adequate ventilation is maintained throughout. My recollection of such examinations when the patient was not accessible in this way is that they were often veritable nightmares. The neck had to be disengaged if the patient was to be turned over and the lung bases examined. The examination commonly had to be extremely cursory, and the poor total ventilation often made it difficult to detect areas of diminished air entry. Positioning of radiographic

1. Lassen, H. C. A. *Lancet*, 1953, i, 37.

plates and centring of tubes were likewise hurried and often erratic. Occasionally the patient would go black in the course of the examination and have to be precipitately restored to the tank.

With the new method the treatment of pressure-points is also much easier, for the back can be attended to often and thoroughly. I saw next to no bedsores at Blegdam Hospital, even though many patients were totally tetraplegic and some were but skin and bone. Technically, this is a remarkable achievement. This is all in striking contrast to the chaotic few minutes during which the severely affected patient can be kept out of a tank respirator: then the back may have to be attended to at the same time as another nurse is administering an enema or giving an injection, and while the doctor is attempting to examine the patient.

Each patient receives physiotherapy repeatedly throughout the day. Hot packs are applied, even in chronic cases, before putting joints through their full range of passive movements. Significant contracture is rare, even in patients tetraplegic for nearly a year. The sight of totally wasted limbs, some showing vasomotor paralyses, quite free of contracture was new to me. This is a triumph which reflects both the thoroughness of the physiotherapist and the "accessibility" of the patient.

Certain changes in the technique originally described by Professor Lassen have been introduced over the past few months. Air is gradually replacing the original oxygen-nitrogen mixtures; open-circuit methods with various ingenious types of expiratory valve are taking the place of the closed circuits with their soda-lime canisters; and ventilation is now carried out at least as often mechanically as by relays of students. The majority of patients I spoke to, who had had experience of both methods, preferred "the machine"—particularly at night. On the other hand most patients had preferred "the students" in the early stages of their disease, when respiratory paralysis was complete, morale rather shaky, and fear of the implications of "engine-trouble" very real. Some patients preferred the students, for conversational reasons. Some students were sociable companions; others had mastered the technique of simultaneous study and ventilation.

There is a certain amount of misconception about the patient's ability to speak when treated by the Copenhagen method. The endotracheal tube is passed through a tracheostomy and is therefore not in contact with the vocal cords. It can be kept in this position much longer than when it is passed through the larynx, without fear of causing ulceration of the mucous membranes. During the phase of bulbar palsy the air-cuff is kept blown up and thus acts as a hermetic seal, isolating the oropharynx from the trachea. Saliva cannot drown the patient; but neither can air pass up the other way, and phonation is therefore impossible. This is only a transient phase, however; most patients with bulbar palsy either die quickly or else recover soon. Chronic bulbar palsy was hardly seen at all. Some patients retain the cuffed tube (changed as necessary) for up to six weeks, but the majority for shorter periods. Once the patient can swallow again, the cuffed rubber tube is replaced by a silver tracheotomy cannula. The patient can then speak intelligibly. This is a big step forward; and all the patients spoken to commented on the profound psychological effect it had had on them. Other notable dates for the patient are those of the removal of the tracheotomy cannula, the discontinuation of assisted (cuirasse) breathing, and finally discharge from the "respiratory" block. The various phases of rehabilitation are somewhat reminiscent of the graduated régime of a well-run sanatorium.

The atmosphere of the wards was one of genuine good cheer, with picture-books and toys in the children's wards and games of chess, wireless, and so on in the wards for adults. Wards containing two or more Both respirators readily assume a sinister appearance; but there was none of this here.

RESIDUAL RESPIRATORY DISABILITIES

321 cases of poliomyelitis with respiratory trouble of one type or another were admitted to Blegdam Hospital following the adoption, late in August, 1952, of the new method of tracheotomy and positive-pressure intratracheal ventilation; the vast majority were admitted during the months of September and October. Of these patients 202 survived. 57% of the survivors still required assistance with breathing after a week, 40% after a month, 28% after three months, and about 20% after six months. At the end of July, 1953, 29 patients (14% of the original 202) still required whole-time or part-time artificial respiration. One fact immediately emerges from these figures—that "respiratory recoveries" are still occurring. I was shown a case in which repeated fluoroscopy had shown paradoxical diaphragmatic movement for nearly six months after the onset of paralysis and where normal movements were beginning.

Careful daily charts are kept of the maximum duration of continuous unassisted breathing each patient is capable of, and also of the number of such attempts he is prepared to make in each twenty-four-hour period. Many of the charts reveal delayed recoveries, some partial, others more complete. The patterns of respiratory recovery are varied. In some cases the duration of individual bouts of unassisted breathing slowly increases; in others the patient gradually becomes capable of many more such bouts each day, without significant change in the duration of each individual attempt.

These facts challenge many widely prevalent views. If, as the Danish figures suggest, recovery of a diaphragm paralysed for several weeks is by no means exceptional, then every effort must be made to keep the patient free of bedsores and contractures for as long as possible. I have mentioned the success of the Danish methods in this respect. Perhaps we used to feel over here that contractures and bedsores were not fundamentally important, when the only prospect was several months in a tank respirator culminating in the merciful release of a terminal bronchopneumonia. It may be argued that at Blegdam Hospital much intensive physiotherapy and nursing was "wasted" on some of the more hopeless cases. (This is a serious ethical problem of which our Danish colleagues are well aware.) Other patients, however, with less severely affected limbs, have without doubt benefited by the new method; for when breathing returned, their limbs were in fair condition. Few patients emerge from a tank respirator, after six months or more, in a condition anything like as good as that of the Blegdam Hospital patients when their cannulæ are finally removed.

29 patients still need ventilation. There is clear gradation of respiratory crippling from very severe to minor, requiring only a little help to ensure a peaceful night; several of these patients are about to be "weaned." Of the patients who had been in the block for more than six months, 8 were incapable of even thirty minutes' continuous unassisted breathing; a further 8 could cope with periods of half an hour to five hours; and 13 managed spans of two or more hours. The "total spontaneous-breathing time" per twenty-four-hour period showed a similar scatter. 9 patients achieved "summated breathing times" of less than half an hour, 9 times of one to twelve hours, and 11 times of more than twelve hours.

In these 29 cases associated paralyses were severe, and at least 17 of the patients were "tetraplegic." "Tetraplegia" here denotes not merely that a few muscle-groups have been paralysed in each limb, but that almost every anterior horn cell—from the upper cervical seg-

ments to the lower sacral—had been severely affected. In many of these cases there is paralysis of the neck muscles with a "floppy head," severe diaphragmatic and intercostal paralysis, and paralysis of the dorsal and abdominal trunk muscles, in addition to virtually total paralysis of both arms and of both legs. In the early stages many of these cases also had paralytic ileus and retention of urine. I attended a necropsy of one such case, and the spinal cord and anterior roots showed a most striking appearance; there were no stones in the kidneys, and the lungs showed no gross changes. The histological material accumulated at Blegdam Hospital in the course of the past few months promises to be most instructive.

Of the 27 patients in hospital for seven months or more, 4 had proved renal calculi, 1 probably had calculus, 1 had an infected bladder and 1 had had hæmaturia. Thus 7 (just under 25%) of this group of patients had urinary complications. This is presumably the price of prolonged immobilisation, though it is difficult to see how it could have been avoided. Pathological fractures have occurred in 2 patients.

My thanks are due to Dr. J. D. Spillane for his help in arranging this visit, and to Prof. H. C. A. Lassen for his permission to comment on the patients under his care. I should also like to thank the staff at Blegdam Hospital for their helpfulness.

Medicine and the Law

Dentist and Anæsthetist

ON questions of professional liability to patients the Ministry of Health neither has nor professes to have any authority to declare the law. It can, however, give guidance as advised by its legal staff.

At a meeting on Sept. 24 London Executive Council heard the Ministry's comments on a case in which the dental service committee had reported its opinion that there had been an unavoidable breach of a dentist's terms of service in connection with the administration of a general anæsthetic. Although the fault lay primarily with the anæsthetist, the responsibility for the treatment of the patient nevertheless rested with the respondent dentist against whom a complaint had been made. The dentist offered to forgo the fee paid to him in respect of an upper denture. The dental service committee recommended that the offer be accepted, the executive council agreed and so also did the Ministry of Health to whom the report was communicated. The Ministry, however, disagreed with the finding that there had been a breach of the terms of service. "The Minister," it stated, "is advised by his lawyers that under the regulations the dentist is not responsible for the acts and omissions of the anæsthetist, and that any person who suffers injury at the hands of the anæsthetist should be left to his civil rights for a remedy."

The Ministry's statement appears to be right and reasonable. Why should a dentist, any more than a surgeon, be responsible for what the anæsthetist does or does not do?

Transfer of Girl from Mental Hospital

The handling by the Home Office of the case of a 14-year-old girl who has spent a year, latterly as a voluntary patient, at Hollymoor Mental Hospital, Birmingham, has been sharply criticised by the chairman of the hospital management committee.[1]

Last year the girl was found by a juvenile court to be in need of care and protection. Five men were convicted of offences against her. Last October, when she was said to have developed suicidal tendencies, she was transferred to Hollymoor Hospital from a remand home.

1. *Times* and *Manchester Guardian*, Sept. 26, 1953.

In a statement issued on behalf of the hospital management committee, Mr. David Rhydderch, the chairman, said that the hospital authorities were informed on the morning of Sept. 22 that the Home Office intended to transfer the girl to Shore Hill Classification School, Warrington, on Sept. 28. On Sept. 23, however, the girl's father gave the statutory three days' notice that he intended to remove the girl from the hospital. The next day the juvenile court amended the original approved-school order, bringing forward the date of transfer to Sept. 25. Mr. Rhydderch said:

> "It may be asked where was the need for such complete synchronised timing arrangements. We have a strong feeling that this was necessary in order to avoid the embarrassing consequences of the legal blunder made when parental authority was reconferred. . . . We deplore the indifference and the neglect of the Home Office authority which allowed this young girl to remain almost 12 months among adult mental cases, in spite of repeated letters pleading for her transfer. We also say that to transfer the girl to a place as distant as Warrington is far from fair to the parents, who will be unable to visit because of the distance and expense of travel."

In a statement issued last Tuesday, the Home Office explained that this case had been under consideration since last April, when on medical advice measures were taken to secure the girl's transfer to an institution for mental defectives. By the end of August no vacancy in an institution for mental defectives had been found by the regional board; and in view of representations by the chairman of the Hollymoor Hospital Management Committee and others, the case was reviewed. In consequence the girl had been transferred to Warrington for observation. The statement pointed out that an order made in September, 1952, for the girl's detention in Newfield School was still in force; but this had to be endorsed for the Shaw School, Warrington.

Public Health

Poliomyelitis

POLIOMYELITIS notifications (uncorrected) in England and Wales during the week ended Sept. 19 (37th week of the year) were as follows: paralytic 123 (92), non-paralytic 104 (81); total 227 (173). This is an increase of 54 compared with the previous week, the figures for which are in parentheses.

This increase is largely accounted for by an increase in notifications of 15 in Coventry and 14 in Kettering; in both places there has been an abnormally high incidence of the disease.

Second Quarter in Scotland

In the three months ended June 30 this year, the birth-rate in Scotland[1] was 18·6 per 1000 population, which is 0·1 more than the rate for the corresponding quarter of 1952. The number of stillbirths was equivalent to a rate of 24 per 1000 total births. The death-rate, as in the corresponding quarter of 1952, was 11·2 per 1000 population. The infant-mortality rate was 29 per 1000 live births; this rate is 5 below that for the corresponding quarter of 1952, and is the lowest recorded for any quarter. The death-rate from tuberculosis was 24 (respiratory 22) per 100,000 population. The former rate is 6 less than that for the corresponding quarter of 1952, and the latter is 3 less; and those rates are 32 and 25 below the five years' average.

Fertility in 1931 and 1939

The last volume[2] in the series of decennial supplements to be issued in connection with the Census of 1931, now published, analyses data on fertility in that year and in 1939.

1. Quarterly Return of the Registrar-General, Scotland: Births, Deaths and Marriages registered in the quarter ended 30th June, 1953. H.M. Stationery Office. Pp. 30. 2*s*. 6*d*.
2. The Registrar-General's Decennial Supplement, England and Wales, 1931: Part IIB, Occupational Fertility, 1931 and 1939. H.M. Stationery Office. Pp. 99. 13*s*. 6*d*.

In England Now

A Running Commentary by Peripatetic Correspondents

IT is probably true that the activities of Mr. William Willett have been on balance beneficial to the country, but in at least one household they have left a legacy of confusion and despair. We can never find the paragraph in the papers which tells us whether to put the clocks forward or back, and if we once falter in our empirical belief and sit down to argue the matter out we are irretrievably lost. In fact, we have to get up unreasonably early on Sunday morning to find out from the B.B.C. whether or not we are two hours wrong.

All this is, of course, child's play to the Americans. We recently attempted a journey by rail from Cincinnati to Chicago, where we were to catch a plane. We were fresh and fit when we reached the travel agency, and we had a little notebook to take it all down in. It was not till we were immersed in schedules that we realised we were travelling on the day summer-time reached Chicago, but not Cincinnati. The young lady was most helpful. We would leave Cincinnati on Eastern Standard Time, but at Chicago we would be on Central Standard Time, so that normally we would have to put our watch back an hour. "But then," she said, "Chicago will be on summer-time, so you'll have to put it right on again." We were immediately roused. "Well, then," we said, "what time is the time we are due to arrive in Chicago written in?" "Central Standard, I guess," said the young lady doubtfully, "I don't know much about trains myself." She rummaged in the back of the schedule. "Yes," she said, "Central Standard." "So," we said craftily, "the train journey will actually take an hour longer than we think it will—or will it?" The young lady smiled patiently. "You won't have to alter your watch, will you?" she said, speaking slowly and distinctly. "No," we replied thankfully. "Well, then," she said, "it will be an hour later than that time on your watch." "We see," we said slowly (we really thought we did). "Then how long will we have in Chicago till the plane leaves?" "Ah," said the young lady in a businesslike fashion, "planes are different. We'll have to see what time your airline is operating on. Where did you say you were going?" We told her, and she had begun to look it up when a thought struck her. "They'll be on Mountain Time, you know," she said, "and that means you'll have to put your watch back two hours instead of one before you get there. Unless, of course, they're having summer-time, too . . ."

We staggered out, our spirit broken. When the time came, we turned up an hour too soon at Cincinnati.

* * *

We have just acquired a puppy of tender age, and he has been installed in a box in the kitchen. The first few nights we had him he cried like a baby and refused to be comforted until he was taken upstairs and allowed to crawl under the bedclothes of one of the junior members of the household. He wasn't cold, he wasn't hungry, he just wanted company in bed with him. But we did not receive an expensive physiological education for nothing, and we have rigged him up a heart-lung preparation in his box for him to sleep with. It consists of a rubber hot-water bottle on top of a ticking alarm-clock, and he sleeps like the dead.

* * *

We thought that what was good enough for T. E. Lawrence would be good enough for us, so the preparations for the expedition were put in hand and one sunny day we set out to follow the master's footsteps. We chose a canoe that was narrow and light—Canadian pattern, we were told, and rather unstable for the novice.

The river was low and the current sluggish, it being the hot season, and we were able to make the upstream journey at a fast pace, the canoe handling beautifully. We had, however, to turn up a narrow tributary to the right and were soon in the shallows and then completely grounded. Stepping out into the now rapid current we hauled the boat up over the flat stones into deeper, calmer water again and then paddled on, ducking our heads to avoid the overhanging vegetation which by now almost closed over the whole width of the stream. All was still and as we rested on our paddles the silence seemed to close in on us and it was a relief to hear the splash of the water again. Rounding a last bend to the right we found ourselves at the mouth of the tunnel which we found to be blocked by underwater debris over which the craft had to be carried. Once this obstacle was passed we found to our relief that we were in deep water again. After about twenty yards the tunnel turned sharply to the left and we were in complete darkness soon to be pierced by the light of our torches. The walls of the tunnel were covered by a slippery brown alluvium but the air was cool and sweet and we made rapid progress. Faintly in the distance we heard the silvery tinkle of a small waterfall which seemed to call us mysteriously on. But suddenly, with a spine-chilling scraping sound, the canoe grounded. We stepped out with some difficulty and pulled the boat forward into deep water again, but on attempting to regain our seats we misjudged the slippery floor and the instability of the craft, the latter turning over, sinking, and precipitating us completely into the black water. Cushions, socks, shoes, paddles began to float away and we retrieved them with difficulty. But the worst task was to raise the dead weight of the boat and hold it up over our heads to empty it. In the confined space the water poured all over us, and when we finally sat down again we squelched miserably. Thrice more we were grounded as the tunnel wound its sinuous way and the roof became alarmingly low. However, we had learned how to get in and out of the canoe without tipping it over and the first horrifying mishap was not repeated. We saw no animal life larger than small water-snails which covered the walls in great numbers and whose sharp-pointed shells were painful to the feet.

After turning a last bend to the right we saw the bright light streaming through the exit ahead, and shooting through a hanging fringe of ivy-leaved toadflax we were out in the warm sunlight and scented air of the water meadow. The narrow canalised stream continued on between high banks overhung by dense bushes and trees and then suddenly widened out and entered the main river, bringing us back to the streets of the town which we had toured by underground waterway.

We were somewhat disappointed by the expedition: Lawrence wrote of fast-rushing water, gates closing the exit of the tunnel, and the danger of being trapped by a sudden rise of water. Maybe he chose the wrong season for his trip; we certainly did—another six inches of water and we would have come through without mishap. The obstacles which had been our undoing were piles of stones and bricks thrown down the inspection holes normally covered by heavy iron lids. It was up these same inspection shafts that Lawrence had discharged his revolver; maybe the bricks and stones indicate retaliation by the surprised citizens of that time.

The boatman seemed surprised at the water in the canoe until we told him that we had capsized. "I told you it was a wobbly one," he said. We could not but agree.

* * *

Once again I've got to face it. I haven't seen a child with a fish-hook in its finger for a fortnight. The spate of Temporary Residents complaining of sunburn, sand in ears, and summer-diarrhœa is easing off. The "Follies" on the Parade have folded their tents. The shops are full of winter clothes, fur-lined gloves, and warm bootees. Summer dresses are disappearing from the Front and swimming-suits are no longer there. My spare time is occupied with bonfires of swept-up leaves. My nine November maternity cases, booked so lightheartedly in the early spring, loom alarmingly near. Patients cluster round for their anti-catarrhal vaccine; one even proudly displays her first crop of chilblains. I've tried to ignore it, but winter will soon be here: the evenings are drawing in, and as usual I don't like it.

* * *

To protect my consulting-suit during the washing-up the children gave me an apron for my birthday. It is a great success, but I tend to keep away from windows, and feel that it might have been more appropriate for one of my surgical colleagues. It is navy blue with white vertical stripes.

* * *

"How Do I Treat My Doctor?"

"Very seldom."

Letters to the Editor

THE R.M.B.F.

SIR,—I shall be most grateful if you will spare space in your columns for me to appeal for donations to the Royal Medical Benevolent Fund to enable us to distribute Christmas gifts to beneficiaries of the fund.

I hope that all members of the profession will contribute towards this extra help at Christmas time, for it is enormously appreciated by doctors and their dependants who have fallen on hard times. The fact that they are remembered by their more fortunate colleagues gives the recipients of gifts even greater pleasure than the gifts themselves, which, however, provide extra comforts or small luxuries for which they have been longing.

I ask subscribers to the Fund to spare a little more for this special purpose, and I beg others to become subscribers at the same time as they respond to my present appeal.

Donations and subscriptions should be sent to the Secretary of the Royal Medical Benevolent Fund, 1, Balliol House, Manor Fields, Putney, London, S.W.15, and marked "Christmas Gifts."

WEBB-JOHNSON
President,
Royal Medical Benevolent Fund.

PREVENTION OF POLIOMYELITIS

SIR,—I have been very interested in the discussion in your columns following Dr. Agerholm's stimulating article (Aug. 8).

I agree wholeheartedly with her views on prevention of spread and necessary quarantine—although at present such measures cannot be fully applied except to school-children, teachers, and food-handlers. A great deal can be done by discouraging unnecessary movement of people from an infected area. Every additional week that the disease is contained in a locality is a great gain in view of the comparatively short season of poliomyelitis.

Dr. Agerholm's hypothesis that changes in the epidemiology of the disease are due to the recent importation of an immunogenically new virus deserves careful consideration. She makes two main points in favour of this hypothesis:

1. "The age incidence has altered. . . ." But this is no recent change, as is shown by the following extract from the annual report for 1911 of the medical officer of health for Cornwall: "the disease has obviously changed its incidence, the average age of 50 consecutive cases being 6 years, which appears to be high for infantile paralysis. . . even adults now frequently succumb to the disease."

2. "The proportion of symptomless infections appears to be greatly reduced, and multiple cases in a family or school have become relatively common." I assume that symptomless infections here means non-paralytic cases.

My experience in Cornwall has been that the ratio of paralytic to non-paralytic cases has varied in different years. In 1947, and again in the present year, there has been a high proportion of non-paralytic cases, and of the paralytic cases few have been really severe; whereas in 1949 and 1950, when the incidence in the county was heavy, there was a high proportion of severe paralytic cases.

Such a variation might well be due, as Dr. Agerholm suggests, to a different virus being present in severe epidemic years. I am uncertain whether there has been any increase in multiple cases of recent years. The difficulty is that few outbreaks before 1946 were adequately documented; indeed, for much of our information we must return to the 1911 outbreak. In this outbreak, Reece tells us (*Rep. loc. Govt Bd publ. Hlth*, 1912), amongst the 154 cases which occurred in Devon and Cornwall, "in four instances there were two cases, in two there were three cases, in four there were four cases and in one instance, there were six cases in a house." It is evident, therefore, that the changes at present apparent in the epidemiology of the disease have occurred gradually and cannot be cited in support of the hypothesis of the recent introduction of a new strain of virus.

Truro, Cornwall. E. R. HARGREAVES.

SIR,—In the Silver Blaze mystery the pivotal fact to Sherlock Holmes's mind was that the dog did not bark in the night, a negative clue: in the mystery of the incidence of poliomyelitis I suggest that sufficient attention has not been paid to the people who are exposed to infection and do not get the disease. Most rural practitioners are familiar with the phenomenon of two or three cases of poliomyelitis (or more commonly of infective hepatitis) occurring in the same parish with no obvious point of contact between them except something remote like the handle of the village post-office door or contact with a contact of a contact, and are irresistibly forced to the conclusion that infection is widespread and susceptibles are rare. Indeed, in several regions of the U.S.A. four-fifths of the population over 14 years of age were found to possess poliomyelitis antibodies. Bearing in mind the prodigious spawning habits of viruses, the country general practitioner realises that with one case in the village it is as if the population of China had erupted into Lower Snoring, which makes Dr. Agerholm's suggestion of corralling herds of contacts a little impracticable. But why does not everyone get poliomyelitis? Individual resistance, the virulence of the organism, chance? From my meagre experience in wandering round as a locum tenens I have a hunch that the main element in determining immunity is the presence of another virus that protects the host, a jealous virus, sometimes acting strongly, sometimes weakly; the well-known viral faculty or gift for "interference." May I summarise the scraps of experience that have led me to this notion?

1. In the Auckland, New Zealand, epidemic twenty-five years ago I was shown cases by Dr. Sweet, the children's specialist, who gloomily admitted that the disease was selecting his Truby-King-fed children, his excessively hygienic babies.

2. A boy of 11 in the junior school, attached to a large public school, whose housemaster's baby had been sent off to hospital with poliomyelitis the week before and whom the boy had actually touched, had a febrile illness with pain in the neck as no. 1 symptom for ten days. The specialist said it was not poliomyelitis, on the insufficient ground that there was no muscular weakness; but, of course, it was. But why did not his younger brother or some other boys at the school who must have been infected get any illness? This is an ordinary experience, a textbook example of the capricious incidence of poliomyelitis.

3. I saw a youth of 19 in a Norfolk village who in an epidemic of sore throats complained of sore throat. On my second visit he diagnosed himself: "I am much better, but I can't lift my left arm." A few days later, a mile away and with no obvious connection with this case, I saw a woman of 33, alone in an isolated house with three young children, two of whom were on her bed. Her chief complaint was pain in the back, following "flu." I wired for her husband who was on service and got the M.O.H. to see her. He was doubtful, but next morning before breakfast there was no doubt at all. She was sent to hospital where, tragically, she died a few days later in an "iron lung." But why did those children escape? There can be no doubt about the virulence of the organism here.

4. In another county I was shown a girl who in a publicised epidemic of poliomyelitis thought she had the disease, but was labelled as "neurotic" on the somewhat inadequate ground that her brother was in a mental hospital. Later I measured her up and found she had muscular wasting and sent her off for treatment. This girl had limped a mile or so to see some friends or relations who had five small children, and I was called to see these, one after another, with temperatures, pains in the back and legs, vomiting, and mild meningism, all of which passed off in twenty-four hours.

I rang up the M.O.H., but he seemed reluctant to play ball with the idea that there could be five cases of poliomyelitis in one household, and being only a locum I let it pass. But what could possibly be the deciding factor which allowed one *group* of children to be infected and another *group* with a closer contact with a known case to be spared?

I suggest that some very rewarding information might be gathered—especially by the field naturalists of medicine, the rural practitioners—by inquiring into what common virus diseases people who get poliomyelitis have not had and close contacts who do not get it have had. Personally my guess is that the villain, or rather hero, of the piece is herpes simplex. It is the most widespread viral infection in man. It is contracted in early childhood and is kept as a slightly irritable pet throughout life. Adults do not get it, but, of course, they periodically display their childhood's infestation. Burnet and Williams found that 93% of hospital patients had antibody in their blood, but only 37% of the more hygienically brought up university graduates. "Over 60% are infected and remain carriers for life" says one of the authors of that mine of information *Virus and Rickettsial Disease*. In short I suspect that herpes-simplex negatives are liable to become poliomyelitis cases. I suggest that there is a prima-facie case for investigation, which, I understand, has not been made. Or in words that Holmes himself might have used: "This herpes simplex fellow, my dear Watson, may be our man."

Beckley, Rye, Sussex. C. G. LEAROYD.

TRANSFUSION OF BLOOD-PLATELETS

SIR,—I think that your leading article on this subject (Sept. 19) calls for comment for the sake of full correctness. Your concern about cerebral hæmorrhage in idiopathic thrombocytopenic purpura is a bit theoretical. The incidence of cerebral hæmorrhage in this condition is low—probably very low. During the past fifteen years I have personally followed up 20 cases; these have included some with profuse bleeding, but none with cerebral hæmorrhage. This is perhaps a small number for firm conclusions, but, as personal series go, it is quite large.

You state that "commonly acute idiopathic thrombocytopenic purpura is clinically severe and responds poorly to splenectomy." The first part of this statement may be true; but the second part does not harmonise with experience in this part of the world. In my series, 6 out of 14 cases had to be splenectomised immediately, owing to profuse bleeding. Of these patients 1 died of thrombosis and subphrenic abscess some time after splenectomy; the rest are fully cured.

Regarding transfusion of platelets before splenectomy, in my experience ordinary transfusion of fresh blood before or during splenectomy has a satisfactory effect. After the splenic vessels have been ligated, the remaining bleeding tendency disappears remarkably soon.

St. Joseph's Hospital, Porsagrunn, Norway. A. SCHRUMPF Chief physician.

TOBACCO SMOKING

SIR,—I should be grateful if you would allow me space to change the middle of the definition of addiction given in my letter last week from "... tolerance to the physical effects of the incorporation on the basic psychic relations with ..." to read "... tolerance to the physical effects of the incorporation, the basic psychic relations with ..."

Shotts, Lanarkshire. R. GOOD.

SIR,—Dr. Good offers us a twelve-line definition of addiction. Might I, with very great respect, suggest that he should read what he has written aloud?

Loughton, Essex. ALEX COMFORT.

URINARY EXCRETION OF CITRATE

SIR,—The interesting preliminary communication last week by Dr. Fourman and Dr. Robinson shows that a decrease of urinary citrate clearance may be associated with experimental potassium depletion in man, but there is no definite proof that this is directly due to the potassium loss. The clearance of citrate by the kidney is a very complex process, since urinary citrate as measured chemically consists of at least three different fractions—i.e., dissociated citrate anions balanced by sodium or potassium, undissociated citric acid itself, and un-ionised calcium citrate chelation complex. Gamble [1] has shown that the degree of dissociation is governed by the urinary pH, and Hastings et al.[2] have studied the effect of citrate as a calcium chelating agent. As will be seen, there is reason to believe that these three moieties are handled differently by the renal tubules.

The renal clearance of citrate is greatly modified by at least five distinct factors: (*a*) plasma level of citrate, (*b*) pH of the urine, (*c*) calcium content of the urine, (*d*) œstrogenic and androgenic steroids, and (*e*) presence of urinary infection.

(*a*) Like most other substances reabsorbed by the tubules from the glomerular filtrate, the citrate clearance increases with rising plasma levels.

(*b*) Free citric acid appears to be reabsorbed preferentially to citrate ion, and therefore the citrate clearance increases as the urinary pH rises.[3 4]

(*c*) Calcium citrate chelation complex is less well reabsorbed, and therefore the citrate clearance increases with a rise of urinary calcium.[5]

(*d*) Œstrogens specifically increase and androgens decrease the renal citrate clearance by a direct action on the renal tubules.[4] This is of little practical importance in the male, but accounts for the wide cyclical fluctuation of citrate excretion in the female during the menstrual cycle.[6]

(*e*) Urinary infection diminishes citrate clearance since citrate is rapidly destroyed by many bacteria in the bladder and the renal pelves as well as in stored urine.[7]

In the course of an investigation on calcium metabolism,[8] all these facts were confirmed but no new information was elicited. In the data presented by Fourman and Robinson, it seems that the effect of variation of calcium content of the urine may have some bearing on the fall of citrate clearance observed. It is virtually impossible to produce an absolutely pure uncomplicated potassium depletion in man. In the method described by Fourman,[9] there is a complicating acidosis due to the use of a sulphonic resin in the ammonium cycle, and also there is preferential absorption by resin of divalent cations in the gut with a consequent reduction in calcium and magnesium intake. Hypocalcæmia and tetany have been reported after relatively short periods of therapy with the sulphonic forms of cation exchangers,[10] and urinary calcium usually drops very rapidly with ingestion of such resins. In experimental potassium depletion studied by Black and Milne,[11]

1. Gamble, J. L. Chemical Anatomy, Physiology and Pathology of Extracellular Fluid. Cambridge, Mass., 1951; chart 20.
2. Hastings, A. B., McLean, F. C., Eichelberger, L., Hall, J. L., da Costa, E. *J. biol. Chem.* 1934, **107**, 351.
3. Östberg, O. *Skand. Arch. Physiol.* 1931, **62**, 81.
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which differed from the method of Fourman in that a resin in the sodium cycle was used in the pre-treatment of the diet, the calcium content of my own urine dropped sharply from 53 to 5 m.eq. per day during the depletion period. I have confirmed the correlation between calcium and citrate excretion in my own case,[8] the correlation coefficient being + 0·92 at ordinary urinary pH range. The regression equation of citrate to calcium was of the formula $y = 0{\cdot}85x + 0{\cdot}2$ where y is citrate excretion in mg. per minute and x is calcium excretion in the same units. It is probable that the regression constants vary considerably from individual to individual. Applying these results to the data on potassium depletion, I would have expected a fall of citrate excretion from 1180 mg. per day to 370 mg. per day *due to the effect of hypocalcuria alone*. This is a greater fall than that recorded by Fourman and Robinson, but it must be admitted that the high-milk diet of our depletion experiment caused an abnormally high calcium excretion during the control period. Studies of citrate excretion will in future be included in a research on potassium depletion at present in progress in these laboratories.

If it is finally shown that potassium depletion has a direct effect on citrate clearance, it is still difficult to agree with Fourman and Robinson that this would probably be secondary to abnormal glucose metabolism with disturbance of the metabolic processes of the tricarboxylic acid cycle. This should influence citrate clearance rather by alteration of plasma-citrate levels than by a direct action on the kidney. The publication in full of the data of Fourman and Robinson, with details of the effect of variations of calcium excretion, will be awaited with great interest.

Postgraduate Medical School of London, W.12. M. D. MILNE.

EXTERNAL CEPHALIC VERSION

SIR,—In reply to Mr. Dalley's letter (Sept. 12), I wish to point out that the two sets of figures he analyses are not comparable. In forecasting the probable outcome of 1000 cases of breech presentation diagnosed during the course of pregnancy in the Middlesex Hospital, he forgets the number of successful versions which would result from version without anæsthesia, and it is in 80% of the remainder that version would be likely to succeed with the help of anæsthesia. Thus the total number of cases in which version as a whole is likely to prove successful is necessarily much more than 80%, and will undoubtedly reduce the incidence of breech presentation in labour well below the 60 per 1000 estimated by Mr. Dalley. In fact our incidence of breech presentation in babies weighing more than 3·3 lb. at birth was slightly below 16 per 1000 (corrected figure).

Middlesex Hospital, London, W.1. M. R. FELL.

ACROPARÆSTHESIÆ IN THE CARPAL-TUNNEL SYNDROME

SIR,—I was very interested in the article on this subject by Dr. Kremer and his colleagues (Sept. 19), as I have dealt with quite a number of these cases by operation. The procedure adopted by me has, however, been a more extensive exploration through a vertical incision, which included examination of the flexor tendons and their sheath as well as the flexor retinaculum. The vertical incision has never caused any contracture, and the median nerve has never become adherent to the scar.

With this more extensive exploration the flexor tendons are seen to be enveloped in œdematous synovial membrane; this œdema, which is often severe, resembles, though it is more extensive than, that seen in tenovaginitis stenosans of the short extensor and long abductor tendons of the thumb. I contend that this condition called acroparæsthesiæ in the carpal-tunnel syndrome is a tenovaginitis stenosans involving the flexor tendons as they pass under the flexor retinaculum. In this particular instance, it is complicated by the passage of the median nerve through the same tunnel as the tendons. The nerve, being the more delicate structure, gives rise to earlier and distinct symptoms.

The treatment is the same as for tenovaginitis stenosans elsewhere—i.e., division of the tight constricting band.

Norwich. G. K. MCKEE.

"COIN" LESIONS OF THE LUNGS

SIR,—Your annotation of Sept. 19 indicates the risks which any person who "believes himself to be in perfect health" may run if he submits himself to mass radiography; for it tells us that if his radiograph shows the shadow of a small healed localised lesion he may be induced to submit in turn to multiple radiographic examinations, tomography, angiocardiography, radioactive isotopes, bronchoscopy, and biopsy.

"When all these investigations have been completed, however, the answer is very often still in doubt. The safest place for these lesions is in the hands of the pathologist, and it is probably wiser to remove them all, tuberculous and non-tuberculous, except perhaps in patients under the age of 30 in whom the shadow lies at the apex of a lobe . . ."

On this principle would it not be logical to remove the lung as soon as you see a shadow on the radiograph? This would surely save our overworked radiologists, biochemists, pathologists, anæsthetists, and all their technical and nursing staffs—yes and the surgeons—a great deal of labour. Speaking of the alternative policy of "waiting, watching, and operating only if the shadow enlarges or excavates," you say that "in view of the safety of modern surgery . . . this course is seldom justified." Is even anæsthesia always administered without risk?

In Storey et al.'s series, of 40 patients (mostly healthy young men on active service) in whom a histological diagnosis was made, the lesion proved to be tuberculous in 70%. As a radiologist with extensive experience in chest work I should say that the majority of the remaining 30% of "isolated, well-defined, spherical shadows" in young Service patients with no symptoms were shadows without the slightest clinical significance. Patients have died after and during such investigations, and if they had no symptoms before operation they have not infrequently had them after it: the mental disturbance, alone, can be serious. Moreover, if the tuberculous lesion is already healed its resection is unlikely to confer the slightest benefit on the patient. True, if left alone it may break down; but, if that happens, a lesion which has healed once will probably do so again if the resistance of the patient is assisted. Finally, have we any proof that resection of a malignant lesion will cure the patient? Are not the "successes" possibly due to erroneous interpretation of histological material? I have known a patient diagnosed as having malignant disease live twenty years after "mere biopsy" as the treatment, and I have seen some spectacular radiographic lesions remain unchanged for as many and more years—until death followed attempts to remove them. I have known of resections for pneumonia.

In the same issue of your journal Dr. Bernard Lennox points out that medicine "has only slowly and painfully won through to some sort of scientific basis." Is not the fault in "some sort of scientific basis"? Dr. Dornhorst (Sept. 5) and Dr. Odlum (Sept. 19) say that there is every need for reorientation in every branch of medicine. Recently a famous surgeon was quoted as saying:

"I advise the man who smokes heavily, especially if he is over 40, to have a chest X-ray every six months—or preferably

every three months—so that the physician can find the cancer, if one develops, while surgery can still cure it."

Apart from the truth that no-one has any right to claim a cure, would it not be wiser, if it can be proved that smoking is the certain cause, to prohibit smoking? I say this though the radiologist, the physician, and the surgeon would be deprived of work.

Has the theory of cellular pathology given us so much help that we need not consider "reorientation"? It seems to me that the clinicians of the past learned more by observation of the patient.

Birmingham. JAMES F. BRAILSFORD.

SURGICAL TREATMENT OF VARICOSE VEINS

SIR,—Shortly after my arrival in Canada I first watched, with horrified fascination, the removal in toto of a varicose vein of the lower limb, from saphenous opening to internal malleolus. Since then the horror has lessened and the fascination increased. I believe this to be a satisfactory operation, at its worst not less effective than high ligation with or without retrograde injection.

Smithers, British Columbia. KENNETH M. LEIGHTON.

SUCCINYLCHOLINE CHLORIDE AND LIVER DAMAGE

SIR,—In his letter of July 11, Professor Macintosh states that during his visit to India and Indonesia he found that "despite malnutrition and anæmia—and presumably 'liver damage'—patients needed curare in larger doses than I had anticipated." He also states that he found that succinylcholine ('Scoline,' 'Brevidil M') behaved in a similar manner.

Two winters ago I spent the best part of three months on a lecture-demonstration tour of Pakistan (East and West), India, Ceylon, Burma, and Iraq and gained the following impressions:

Intravenous Anæsthetics

Anæsthetic drugs which are given intravenously and are known respiratory depressants had to be used with caution; otherwise long periods of apnœa resulted. Many patients showed marked muscular relaxation with what we in England would regard as modest doses of thiopentone; for instance, Dr. H. Barat, anæsthetist at the Eden Hospital, Calcutta, demonstrated two anæsthetics for sterilisation of female patients using thiopentone alone (i.e., without additional inhalation anæsthesia) in doses of 11·5 ml. and 14 ml. respectively. By and large, I gained the impression that the dosage of thiopentone required ('Pentothal' or 'Intraval') was about two-thirds of that which I had been accustomed to giving at home in England. Postoperative respiratory depression was most marked when pethidine had been used during operations (perhaps because it is detoxicated almost entirely by the liver), and great vigilance had to be observed to prevent morphine being given *as a routine* after operations instead of being withheld *until the patient complained of pain.*

Muscular Relaxants

Except in Iraq *d*-tubocurarine and gallamine ('Flaxedil') were required in about two-thirds to four-fifths of the dose one was accustomed to use in England. Scoline was not demonstrated as it was thought inadvisable to demonstrate a drug which at that time was still in the experimental stage.

Spinal and Extradural Anœsthesia

Owing no doubt to the patients' shortness of stature spinal anæsthesia could often be induced with surprisingly small doses. For instance, in Colombo I achieved spinal anæsthesia for a panhysterectomy using only 8 ml. of 1 in 1500 solution of 'Nupercaine.' Admittedly the injection was given in the sitting-up position, but the patient was placed on her back as soon as the injection had been finished and the puncture-mark swabbed with iodine. Skin analgesia rose to the level of about the eighth thoracic segment. I feel quite sure that few anæsthetists would stake money on achieving analgesia to this height with such small doses given to an average patient in the British Isles. Iraqis needed doses similar to our own, particularly if they came from Kurdistan. Owing to the low salt intake and the prevalence of vegetarianism (with the consequent consumption of second-class proteins) blood-pressures in the Indian subcontinent are rather low, and anæsthetists there are in the habit of giving spinal anæsthesia to any patient with a systolic blood-pressure above 100 mm. Hg. When used for cæsarean section I found that spinal anæsthesia caused a similar drop in blood-pressure to that in English patients; it was, however, sometimes difficult to restore the blood-pressure to normal by the use of vasopressors. In one instance—a Chinese patient in Rangoon—prophylactic ephedrine and doses of methylamphetamine ('Methedrine') during the operation failed to prevent a dangerous fall of blood-pressure; intravenous noradrenaline did, however, bring the blood-pressure back to normal. Using lignocaine ('Xylocaine') extradural anæsthesia (sacral extradural and spinal extradural) required much the same dosage as is used for patients in Europe and the U.S.A.

Resuscitant Drugs

The effect of thiopentone and pethidine could be reversed quite readily by nikethamide (and a similar experimental drug issued privately by Imperial Chemicals [Pharmaceuticals] Ltd.) in the usual doses. Neostigmine (with atropine) proved an adequate antidote to *d*-tubocurarine and gallamine.

It is, of course, difficult to know what Professor Macintosh had in mind when he used the words "larger doses than I anticipated"; and it may be that he found, as I did, that the dose of *d*-tubocurarine and gallamine ranged around 70% of that used in England. Again, when using several intravenous agents each of which is a central or peripheral respiratory depressant, it is often difficult to judge which of these drugs is responsible for any excessive apnœa—i.e., Professor Macintosh may have used smaller doses of thiopentone than I was using and therefore required larger doses of the curare drug to secure quiet respiration and muscular relaxation. I would be interested to know whether Professor Macintosh agrees with me that intravenous anæsthesia must only be administered to Asian patients in cautious doses.

King's College Hospital, London, S.E.5. A. H. GALLEY.

JUVENILE DELINQUENCY IN NORTH AMERICA

SIR,—In your article last week on this subject you state that it is rare in this country for a juvenile case to be heard in a criminal court. What I assume you mean is that it is rare for a juvenile case to be heard in an adult court, since all our juvenile courts are in fact criminal courts.

In this country the age of criminal responsibility is fixed at 8 years, which is much less than that fixed by any other country outside the British Commonwealth. On the Continent it is generally 13 or 14. Children under that age, some of whom would here be regarded as law-breakers, are dealt with by a child-welfare organisation and not by any judicial process.

Our exceptionally low age of criminal responsibility is apt to strike foreign observers as both absurd and shocking, and there are very real practical drawbacks to it. Sometimes a child may appear before a juvenile court for whom some special treatment is clearly necessary; but the magistrates may find their hands tied, either because the evidence is not sufficient to prove the particular offence, or because the police charge is not exactly in accordance with the facts. Whatever steps they might like to take for the child's welfare, they have no option but to dismiss the case.

Another drawback of the status of our juvenile courts is that it leads to a hard and fast division between the treatment of the child labelled delinquent and the child labelled maladjusted, though as a matter of common sense such a division is meaningless. So many maladjusted children are delinquent and so many delinquent children

are maladjusted. In a school where the staff is alive to the problems of the maladjusted, a child may be recognised as such at an early stage, and sent to a special school under the educational authorities. Elsewhere a child of much the same type will be left to carry on until he finds himself in a juvenile court when he will be dealt with by the Home Office machinery, being either put on probation or sent to an approved school. One cannot hope to get the most suitable treatment for the individual when it is so often a matter of chance which of two entirely different systems the child comes under.

If we had welfare organisations on the Continental lines instead of criminal courts for children of school age, any child needing special treatment could be dealt with according to his needs. Results would not be influenced by a rigid and artificial distinction.

Howard League for Penal Reform,
Parliament Mansions,
Abbey Orchard Street,
London, S.W.1.

W. A. ELKIN
Hon. librarian.

LEGAL RESPONSIBILITY IN BLOOD-TRANSFUSION

SIR,—May I have the opportunity, perhaps, of allaying the fears expressed by Dr. Leyton in his letter last week.

I think I am correct in saying that the allergic manifestations of migraine are rather unlike those of the allergic conditions mentioned in my paper, in that it can only very rarely, if ever, be treated on allergic grounds, and secondly, if there is a sensitivity basis present, skin tests are never positive—i.e., indicating that there are no circulating non-precipitating antibodies that can be demonstrated.

Furthermore, recent work [1] shows that, genetically, there does not seem to be any evidence that migraine can be included among those allergic conditions which are considered unsuitable in a donor. The possibility, however, of mendelian characteristics being transmitted by transfusion, an idea regretfully abandoned in the 17th century, reopens a vista of limitless extent.

Where cases of the passive transfer of sensitivity from donor to recipient have occurred, the sensitisation is not of long duration, and, in fact, the chief problem in transfusion work is to avoid producing reactions in donors who have "reagins" in their plasma.

Finally, I should be most grateful to Dr. Leyton if he could produce any evidence, published or personal, that migraine is transmitted by transfusion.

North London Blood Transfusion Centre,
Deansbrook Road,
Edgware, Middlesex.

J. D. JAMES
Director.

CIRCUMCISION

SIR,—May I add a few remarks to those of "Sir Daniel Whiddon"? First of all some historical notes:

According to the Bible, circumcision symbolised God's covenant with the people of Abraham—i.e., all those belonging to the House of Abraham, including those of non-Jewish origin. ("And ye shall circumcise the flesh of your foreskin . . . and he that is eight days old shall be circumcised among you, every man child in your generations, he that is borne in the house, or bought with money of any stranger, which is not thy seed.") This latter circumstance supports the hypothesis that circumcision was only a form of tribal marking, enabling the nomadic Jews to produce a secret sign of the fact of belonging to one tribe. All other explanations of the purposive character of circumcision are of modern origin.

At the time of the ancient Jews, circumcision was not practised by the Semitic tribes who surrounded them. This transpires from the Bible in connection with the amorous adventure of Shehem, who wished to marry Dinah, Jacob's daughter, and was given permission on condition that "every male of you be circumcised."

Apart from Jews, only Mohammedans practise circumcision. (The term Mohammedan is not synonymous with Arab.) In the Koran we find no references to circumcision: only the Hadish, the explanatory text of the Koran, mentions this. According to the latter Mohammed declared *Kaft* (circumcision) to be compulsory on all his followers. Why then was it made compulsory? No-one knows with any degree of certainty. Educated Mohammedans, like Jews, mention hygienic reasons. However, it is more likely that Mohammed, who claimed that he and his people were the descendants of Ishmael (who was one of the sons of Abraham and the Egyptian Hagar), intended to establish a closer relationship between himself, his people, and Abraham himself by affirming the ritual of circumcision. Abraham, by the way, is one of the most imposing figures in the Koran. Even the great festival of Beyraam commemorates the sacrifice of Isaac.

Modern Mohammedans and modern Jews try to submit a modern justification for the practice of circumcision. But the prepuce is no hindrance to personal hygiene if a person wishes to wash properly; its removal has not increased resistance to venereal diseases; and circumcision does not reduce sexual desire.

The statements of Sir Daniel Whiddon should, however, be amended in one or two particulars. First, the human prepuce is not only a protective covering for the glans penis, but, by the secretion of its glands (smegma), it gives the glans a greasy surface which facilitates its entry into the vagina. Secondly, Sir Daniel says that the prepuce unfolds as the penis advances through the vagina; but actually a normal prepuce is already unfolded, and the glans is uncovered, at the time of erection. Thirdly, in asking "Is there such a thing as a baby with phimosis?" he replies "I have never seen one." But phimosis is not uncommon among babies—though rarely sufficient to obstruct urination, and all male babies have to be examined after birth to see whether they have phimosis or the condition termed adhæsio cellularis preputii ad glandem which can be relieved easily after birth, but not so easily later. On the other hand, phimosis, when it is present, can be relieved easily by plastic surgery even without recourse to circumcision; and the advantage of such operations is that the prepuce survives to perform its physiological function. I share Sir Daniel's opinion that circumcision is a barbarian practice, to be avoided wherever possible.

European Hospital,
Alexandria, Egypt.

D. A. KENEDY.

1. Schwartz, M. Heredity in Genetical Asthma. *Acta allerg., Kbh.* 1952, **5**, suppl. 2.

Appointments

HOPKINS, G. B., M.B. Birm., B.PHARM. Lond.: asst. county M.O., Bucks County Council.
JONES, O. G., M.R.C.S., D.C.P.: asst. pathologist (S.H.M.O.), Caernarvon and Anglesey H.M.C.

Manchester Regional Hospital Board:

COSTELLO, SHEILA, M.B. Manc., D.A.: consultant anæsthetist, Bolton and district hospital centre.
EDGE, J. R., M.D. Leeds, M.R.C.P.: consultant chest physician, Barrow in Furness hospital centre.
FLETCHER, D. E., M.B. Leeds, F.F.R., D.M.R.D.: consultant radiologist, Barrow in Furness hospitals.
MAY, W. R., M.B. Lond., M.R.C.P., D.C.H.: consultant chest physician, Rochdale and district hospital centre.
WARD, JAMES, M.B. Lpool, D.C.P.: asst. pathologist, Barrow in Furness hospital centre.

South East Metropolitan Regional Hospital Board:

ANDERSON, A. W., M.D. Lond.: consultant in chest diseases, Hastings hospital group.
BRAIN, R. H. F., M.B. Birm., F.R.C.S.: consultant thoracic surgeon, Brighton and Lewes and Preston Hall hospital group.
COPE, D. H. P., M.B. Lond., F.F.A. R.C.S.: consultant anæsthetist, Lewisham hospital group.
HART, W. S., M.B. Madras, D.A.: consultant anæsthetist, Woolwich hospital group.
HUGHES, D.R., M.B., B.SC. Wales, M.R.C.O.G.: consultant obstetrician and gynæcologist, Woolwich hospital group.
KING, M. B., M.D. Lond.: asst. pathologist, Bromley, Orpington, and Sevenoaks hospital group.
MITCHELL, P. H., M.A., M.B. Camb., D.P.M.: asst. psychiatrist, Oakwood hospital group.
TRETHOWAN, J. D., M.B. Camb., F.R.C.S., D.L.O.: consultant in E.N.T. surgery, Seamen's hospital group.
WHITE, S. E., M.R.C.S., D.O.M.S.: ophthalmologist, Bermondsey and Southwark hospital group.

Obituary

CHARLES BERNARD GOULDEN

O.B.E., M.A., M.D., M.Chir. Camb., F.R.C.S.

Mr. Goulden, consulting ophthalmic surgeon to the London Hospital, consulting surgeon to the Royal London Ophthalmic (Moorfields) Hospital, and formerly consulting oculist to the Household of Queen Mary, died at his home at Shepreth on Sept. 20, at the age of 74.

He was the eldest son of the late H. J. Goulden, of Canterbury, and he was educated at St. Edmund's College, and at Downing College, Cambridge. Later he always spoke gratefully of his years at Downing, for till then, he said, he had had no outside interests except music. At Cambridge his horizon enlarged, but he still worked hard; for his parents were not wealthy and he knew that he had his own way to make. He completed his medical education at the Middlesex Hospital, where he held a Freeman scholarship and a Leopold Hudson exhibition. He took his M.B. in 1904 and his F.R.C.S. a few months later. After holding a house-appointment at the Middlesex he went to Moorfields, and one of his senior colleagues recalled him as "one of the best house-surgeons we ever had." But he could not afford the unrewarding first years of consultant practice in London, and after a period as demonstrator in anatomy at the University of Bristol he finally settled at Oldham where he was appointed to the staff of the Royal Infirmary.

In 1916 he left Oldham to serve in France, where he became Sir William Lister's right-hand man at Boulogne. Later he was put in charge of an ophthalmic centre at Rouen. For his work there he was mentioned in despatches and appointed O.B.E. in 1919. On demobilisation he was offered an appointment at the London Hospital, and his Metropolitan colleagues welcomed his return. Soon afterwards he joined the staff of the Victoria Hospital for Children in Tite Street and the Queen Alexandra Hospital, Millbank. He was also appointed to the staff at Moorfields, where he soon became dean of the medical school. At the London Hospital he also joined in the work of teaching and became lecturer in ophthalmology at the medical college. In due course he also examined for the M.S. Lond., the F.R.C.S., and the D.O.M.S., and later he served on the board of advanced studies of the University of London and on the committee of applied optics of the Imperial College of Science. As a teacher he showed the same qualities which served him so well as a surgeon—precision of thought, decision for appropriate action, meticulous attention to detail, and where necessary ruthless determination. In 1924 he published his Moorfields lectures for the D.O.M.S. course, under the title of *Refraction of the Eye*, and it was characteristic of Goulden that he succeeded in making the section on optics no less lucid and interesting than the more clinical parts. In 1924 and again in 1932 he was chosen to give the Montgomery lectures to the Royal College of Surgeons in Ireland.

When the second world war began in 1939 he found ample scope for his energies, first of all in the day-to-day clinical work at The London and Moorfields and then as adviser to the Ministry of Health on the ophthalmic side of the Emergency Medical Service. His knowledge of the men available and his understanding of the needs of the different areas made his service invaluable. The strain, however, was severe, since this work entailed much travelling in London and the Home Counties. He lived partly in London and partly at Shepreth and he experienced the difficult times of aerial bombardment. He also undertook the supervision of and much of the actual work in the E.M.S. hospital at Goodmayes, and for a man of any age this volume of work was most exacting.

With the close of the war he retired from his appointments at the London Hospital and at Moorfields. He had in fact left the latter rather earlier but had returned to fill the place of younger men serving with the Forces. But though Goulden retired from hospital he continued his private practice, and in the years 1944–46 he was president of the Ophthalmological Society of the United Kingdom. He filled this office with great distinction, and his presidential address on Purkinje was an indication of his great interest in history. Most of his address dealt with Purkinje's *Commentary on the Physiological Examination of the Organ of Sight and Cutaneous System*. Goulden said this book was written in ecclesiastical Latin difficult to translate, and one suspects that he studied it in the original.

M. H. W. recalls how "just before the late war, Goulden bought a delightful little house at Shepreth, near Cambridge, and as time went on he spent more of his time there and less in London. It was a sad blow to his friends when they heard that he had undergone a severe operation, but those who visited him afterwards in the London Hospital were filled with admiration at the physical and moral courage which he showed. This misfortune hastened his retirement from active work, and he now lived entirely at Shepreth where he enjoyed the beautiful surroundings and the opportunity of frequent visits to Cambridge to his old college, Downing, and to the dinners of the Cambridge Medical Graduates' Club. He continued to come to London also till very recently, but when I called on him early this year could not fail to see how frail he had become though still retaining all the keen, intelligent interest in affairs which he had always shown.

"All of his friends must feel deeply the passing of one whose influence on the ophthalmological world, especially on the side of education, has been so considerable and whose charming and often amusing companionship was always so acceptable."

In 1911 Mr. Goulden married Miss Norah O'Brien. There were no children of the marriage.

JOHN FRANCIS CARTER BRAINE

M.D. Durh., F.R.C.S., F.F.R., D.P.H.

Mr. Carter Braine, director of the radiotherapeutic department of Guy's Hospital and civil consultant in radiotherapy to the Royal Navy, died at his home in Speldhurst on Sept. 20.

He qualified from Guy's Hospital in 1916, and at once joined the R.A.M.C. to serve in France and later in East Africa. On his return to Guy's at the end of the war, he was appointed demonstrator of anatomy, and in 1922 he took the F.R.C.S., a distinction also held by his father and grandfather. For some years he worked in the department of pathology under Prof. Adrian Stokes, and while Griffiths demonstrator he submitted the thesis for the M.D. of Durham University for which he was awarded the gold medal. He held the post of chief assistant in the old actinotherapy department at Guy's before he was appointed to the staff as surgeon to the radiotherapy department in 1935. He was also a member of the staffs of the West London Hospital and the King Edward VII Hospital, Windsor.

During the late war Carter Braine acted as adviser in radiotherapy to the group officer, and his help was of inestimable value in the organisation of radiology in the Guy's sector. When the war broke out, all the radiotherapy beds at Guy's were closed and the equipment was moved from London. One unit was taken to Sherwood Park, Tunbridge Wells, and there, by arrangement with the medical school, he was able to continue his clinical work. When the Guy's U.S.A. Hospital was opened at the Wildernesse, near Sevenoaks, in 1941, it proved possible, with his help, to create, in hutted accommodation, a radiotherapy department which remained in use until the end of the war, when it was transferred to Pembury Hospital. During the whole period, Carter Braine never spared himself, and he must have covered well over 100,000 miles travelling between Tunbridge Wells, Pembury, the Wildernesse, and London, driving himself in all weathers and in the blackout.

He was a foundation member of the Society of Radiotherapists of Great Britain and Ireland, and he was a member of the official British delegation to the fifth International Congress of Radiology in Chicago in 1936. He also acted as assistant treasurer and member of the board of management of the sixth International Congress of Radiology in London in 1950.

Three of his colleagues have sent us this joint tribute:

"The first deep X-ray plant in England was installed at Guy's, and from these early days Carter Braine worked unceasingly to improve techniques and results. Few could claim the wealth of experience which he possessed. His clinical judgment, tempered by a profound understanding of the suffering and anxiety of his patients, was an inspiration and challenge to all who worked with him. His constant enthusiasm and encouragement evoked a loyalty in his staff which can seldom have been matched. To his great generosity many can testify, and he unhesitatingly used his own equipment to treat hospital patients if he felt it was to their advantage. Not least among his many talents was an ability for organisation, which reached its zenith during the war years.

"Though his professional life was extremely busy he had wide interests outside his work. He dearly loved the country and this was reflected in the careful husbandry of his farm. He was interested in art and architecture, as well as all things mechanical, and he delighted in visiting factories and research departments to see for himself how things were made. He was a keen and competent photographer, an interest reflected in the excellent clinical photographs and lecture slides of his department.

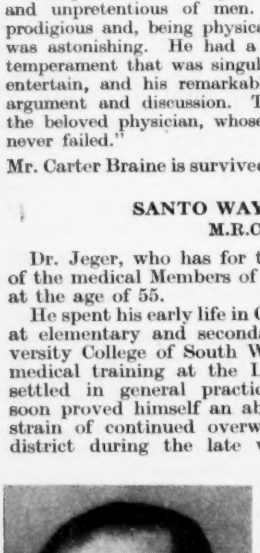
"Despite his vast experience, he was the most modest and unpretentious of men. His capacity for work was prodigious and, being physically very robust, his endurance was astonishing. He had a great sense of humour and a temperament that was singularly equable. He delighted to entertain, and his remarkable memory served him well in argument and discussion. To his patients he was indeed the beloved physician, whose sympathy and understanding never failed."

Mr. Carter Braine is survived by his wife and one daughter.

SANTO WAYBURN JEGER
M.R.C.S., M.P.

Dr. Jeger, who has for the last eight years been one of the medical Members of Parliament, died on Sept. 24 at the age of 55.

He spent his early life in Cardiff, where he was educated at elementary and secondary schools and at the University College of South Wales. Having completed his medical training at the London Hospital in 1923, he settled in general practice in Shoreditch, where he soon proved himself an able and popular doctor. The strain of continued overwork in this heavily bombed district during the late war, and his responsibilities in charge of a mobile ambulance unit, contributed to the coronary thrombosis from which he never completely recovered.



[*Elliot & Fry*

His political career also started in Shoreditch, for he was elected to the borough council in 1925, became mayor in 1930, and in the following year began his 15-year membership of the London County Council. About this time he took an important part in the early activities of the Socialist Medical Association, and during the Spanish civil war he twice went to Spain on behalf of the Spanish Medical Aid Committee.

In 1945, he was elected Labour Member of Parliament for South-East St. Pancras, and after the redistribution of parliamentary constituencies he sat for Holborn and St. Pancras South. In 1946 he visited Austria as a member of a Parliamentary delegation.

B. S., one of his medical colleagues in the House of Commons, writes:

"Jeger served his constituents in Parliament as only a practising doctor can. He brought into the House an atmosphere of realism tempered by his ideals, and based upon his daily contacts with the needy and the sick. His special interests lay in the pursuit of remedies for the social and physical ailments of humanity. For this reason he was an ardent supporter of the National Health Service, and his speeches in support of the principles of a free and comprehensive service were models of close reasoning and forthright to a degree. He was bitterly opposed to the imposition of any charge for any part of the service, and never hesitated to make his opposition clear. His work as a doctor also led him to agitate for improved standards of housing. He felt that the slum house was his personal enemy, for in everything he did we sensed in him his rôle of the physician.

"All of us valued his friendship and his mature judgment. He had great experience as an administrator before he entered Parliament and this, combined with his idealism, gave his opinions added weight. He loved peace and abhorred cruelty. The views he held on foreign affairs were a few years ago thought to be to the Left of some of his colleagues, but are now such as almost everyone accepts.

"Many of us have cause to remember him with gratitude, for even in the House he was always helpful to those who fell sick and needed his help. That he worked too hard, and was indifferent to his own suffering, does not surprise any doctor. For the pain and distress of others he was only too sensitive.

"I will miss mostly his exquisit sense of humour, a well-burnished weapon which he could use against himself as easily as against an opponent. He could have lived longer had he so wished, but he preferred to live his life in full."

His wife, who is a journalist, is a member of the L.C.C. and of Holborn Borough Council, and his younger brother is M.P. for Goole.

KENNETH EDWARD ECKENSTEIN
M.B. Lond.

Dr. Eckenstein, consulting physician and pathologist to the French Hospital in London and a former president of the Chelsea Clinical Society, died on Aug. 23.

He was born in 1881 in Liverpool, where his father Wilhelm Eckenstein held the appointment of Swiss vice-consul, and he was educated at Uppingham. He qualified from St. Thomas's Hospital in 1906, taking his M.B. Lond. the following year. After holding resident appointments at St. Thomas's, at The Hospital for Sick Children, Great Ormond Street, at the Chelsea Hospital for Women, and at the French Hospital in London he became in 1908 assistant to Professor Sabrazès at the clinical laboratory of Bordeaux, and with his chief he described a simplified method of diagnosing syphilis by complement-fixation. In 1910 he returned to London to take up the appointment of pathologist to the National Hospital for Diseases of the Heart. His years of practice in London were interrupted only by his service during the 1914–18 war as a medical officer with the French army, for which he later received the Croix de Guerre and was appointed chevalier of the Order of the Crown of Belgium and an officer of the Legion of Honour.

Though he was himself British-born, Dr. Eckenstein spoke French perfectly and he had many contacts with the French-speaking communities of London. Besides his appointment at the French Hospital he was also physician to the French Consulate, medical inspector of London French Catholic Schools, consul of Monaco in London, and a correspondent of the *Swiss Observer*.

For over forty years he was closely associated with the Chelsea Clinical Society, which he served as secretary, president, and treasurer, holding this last office till the end of his life. He rarely missed a meeting and his erudite and lively conversation added greatly to the interest of the dinners which traditionally precede these gatherings. He leaves a widow and one daughter.

NEST KAHAN
M.B. Lond., D.P.M., D.C.H.

Mrs. Kahan, registrar at the Horton Hospital, Epsom, died on Sept. 16 at the age of 42. Her maiden name was Thomas, and she qualified from the Royal Free Hospital in 1934, taking her M.B. Lond. three years later. For most of the late war she held an appointment as physician at the E.M.S. Southern Hospital, Dartford, Kent. When she gave up that appointment in 1947 her interest turned to psychiatry, but in 1948 her career was for the first time interrupted by ill health. She was appointed to

Horton Hospital in 1949, and for the greater part of her period of service there she held the position of registrar. She obtained the D.P.M. in 1952.

J. H. W. writes: "Dr. Kahan was a shrewd and careful clinician and her experience and special qualifications were invaluable during the difficult period when Horton Hospital was reverting to its original psychiatric function. She will be long remembered for her happy relationship with both staff and patients and for her humane attitude to their problems. During the last two years she was often in pain, and her steadfastness, courage, and devotion to duty were the admiration of all who shared her secret."

Her husband is Dr. Alexander Kahan, consultant physician to St. James' Hospital, Balham, and she leaves a son and a daughter.

Diary of the Week

OCT. 4 TO 10

Tuesday, 6th

INSTITUTE OF DERMATOLOGY, St. John's Hospital, Lisle Street, W.C.2
5.30 P.M. Dr. C. O. Carter: Principles of Genetics.

Wednesday, 7th

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
5.15 P.M. *Section of History of Medicine.* Colonel H. R. Gilmore (Washington, D.C.): Medical Aspects of the Assassination of Abraham Lincoln. Dr. Bernard Freedman: Last Illness of Dr. Edward Wilson of the Antarctic.
8 P.M. *Section of Surgery.* Sir Heneage Ogilvie: Life's Like That. (Presidential address.)
INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. H. Haber: Normal Histology of the Skin.
INSTITUTE OF NEUROLOGY, the National Hospital, Queen Square, W.C.1
5 P.M. Sir Francis Walshe, F.R.S.: Principles of Clinical Neurology.
EUGENICS SOCIETY
5.30 P.M. (Burlington House, Piccadilly, W.1.) Mr. James Shields, B.A.: Personality Differences and Neurotic Traits in Normal Twin Schoolchildren.
YORKSHIRE SOCIETY OF ANÆSTHETISTS
8 P.M. (Leeds General Infirmary.) Dr. W. D. Wylie: Obstetrical Anæsthesia with Particular Reference to Cases with Cardiac Disease.
MANCHESTER MEDICAL SOCIETY
4.30 P.M. (University of Manchester.) Prof. John Morley: A Surgical Retrospect. (Presidential address.)

Thursday, 8th

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (Senate House, University of London, Malet Street, W.C.1.) Sir Henry Dale, O.M., F.R.S.: Scientific Method in Medical Research.
COLLEGE OF GENERAL PRACTITIONERS
5.45 P.M. (Society of Apothecaries, Black Friars Lane, E.C.4.) Dr. Geoffrey Barber: Entry into and Setting up in General Practice.
LONDON HOSPITAL MEDICAL COLLEGE, Turner Street, E.1
5 P.M. Sir James Spence: Varieties of Clinical Experience. (Schorstein lecture.)
ROYAL SOCIETY OF MEDICINE
5 P.M. *Section of Ophthalmology.* Mr. J. P. F. Lloyd, Dr. S. A. E. Hakim: Epidemic Glaucoma.
8 P.M. *Section of Neurology.* Dr. E. A. Carmichael: Pattern of Autonomic Function. (Presidential address.)
ALFRED ADLER MEDICAL SOCIETY
8 P.M. (11, Chandos Street, W.1.) Discussion between Psychiatrists and Physicians on Psychological Reactions to Physical Disease.
UNIVERSITY OF ST. ANDREWS
5 P.M. (Medical School, Small's Wynd, Dundee.) Sir Russell Brain, P.R.C.P.: Consciousness and Unconsciousness.

Friday, 9th

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. O. L. S. Scott: Developmental Abnormalities.

Saturday, 10th

SOUTH EAST METROPOLITAN REGIONAL TUBERCULOSIS SOCIETY
11 A.M. (Grove Park Hospital, Marvels Lane, Lee, S.E.12.) Sir Geoffrey Todd, Dr. James Maxwell, Major Thomas C. Wright, U.S.A.F., Mr. F. Ronald Edwards: Brains Trust.

Births, Marriages, and Deaths

BIRTHS

SAMUEL.—On Sept. 19, at Johannesburg, South Africa, to Vera, wife of Dr. Eric Samuel—a daughter.

DEATHS

ZUCKERMANN.—On Sept. 29, at Nottingham, Ernst Zuckermann, M.D. Breslau, L.R.C.P.E.

Notes and News

INQUIRY INTO HEALTH VISITING

THE Ministers of Health and Education and the Secretary of State for Scotland have appointed a working party to advise on the proper field of work and the recruitment and training of health visitors in the National Health Service and School Health Service. The chairman of the working party will be Sir Wilson Jameson, F.R.C.P.; and its members are Dr. A. Beauchamp (Birmingham), Alderman Mrs. K. Chambers, C.B.E., LL.D., J.P. (Bradford), Miss E. G. Himsworth, R.G.N., S.C.M. (nursing supervisor for Midlothian and Peebles), Miss E. Stephenson, S.R.N., S.C.M. (chief nursing officer, Newcastle upon Tyne), and Dr. J. F. Warin (medical officer of health, Oxford). The working party will be advised by a steering committee, also under the chairmanship of Sir Wilson Jameson, on which the Government Departments concerned will be represented. This will have the expert advice on social workers and their training of Miss Eileen Younghusband, M.B.E., J.P., and Prof. R. M. Titmuss.

The inquiry, work on which will start this month, is expected to deal with the general position of the health visitor in the light of experience now gained—including, for example, ways in which she might coöperate with the family doctor and the hospitals—but not with services with which the appointing Ministers are not directly concerned. The joint secretaries to the inquiry are Mr. R. Pronger and Miss M. H. Cook, S.R.N. (Ministry of Health, Chesham House, Regent Street, London, W.1).

TREASURES OF ORTHOPÆDICS

BEFORE concluding his term of office as president of the British Orthopædic Association, Sir REGINALD WATSON-JONES, with Lady Watson-Jones, gave a dinner at the Royal College of Surgeons on Sept. 25, when the guests included former presidents of the association and members of the executive. One of his aims as president, he said, had been to strengthen the younger generation's appreciation of what had been done by their forerunners, and he had been disturbed at the thought of many of the historic treasures of orthopædics, up and down the country, being irretrievably lost. With the help of Mrs. Hilda Watson and Lady Probyn-Jones (daughter and daughter-in-law of Sir Robert Jones), and others, he had in the past twelve months formed the nucleus of a national collection which would be housed, for the association, at the Royal College of Surgeons. Local collections—at Liverpool and Oxford for example—should be maintained and extended; and to correlate all these possessions a new office had been created—that of keeper of the archives of the British Orthopædic Association. ("Rocyn-Jones doesn't know it yet, but he is the keeper of the archives . . .")

Prof. BRYAN MCFARLAND, president-elect, who presented a chisel used by Robert Jones at his last public operation, said that such things were symbols evoking memories. From tradition springs the desire to emulate and if possible surpass the achievement of our predecessors, to maintain their high principles, and to hold the ground they gained. Hillary and Tensing had climbed Everest on the shoulders of their fellows, and these on the shoulders of previous expeditions. Such reflections inspired collective pride but personal humility—a firm basis from which to hand on the treasures of the past.

Sir THOMAS FAIRBANK recalled a day at Liverpool some 27 years ago when he assisted Robert Jones in conducting the second examination for the M.CH. ORTH. and two of the four candidates were R. Watson-Jones and B. L. McFarland. He proposed the toast of Two Historic Treasures Happily Still with Us—the president and president-elect. Mr. WILLIAM GISSANE, as a Birmingham surgeon, spoke on behalf of what he called the dominions and colonies of orthopædics.

The chief guest, Lady Probyn-Jones, presented an embroidered smoking-cap belonging to Hugh Owen Thomas, and Mrs. Watson had sent a portrait of her father by Copnall. Other exhibits included the signet ring and piccolo of H. O. Thomas, his annotated interleaved copy of the 1st edition of a volume of contributions to medicine and surgery and the annotated letters (some in Welsh) of his great-grandfather Evan Thomas, which (said the President) give a vivid idea of the atmosphere of orthopædic surgery at that period. Among MSS. were letters on the foundation of the British Orthopædic Association, and among drawings some early etchings by Sir Thomas Fairbank.

From the College of Surgeons library and museum, Mr. W. R. Le Fanu and Mr. W. E. Thompson showed books, specimens, and instruments. The specimens included a series by Sir William Macewen illustrating the growth of bone, and another, on the transplantation of bone, illustrating the essay with which E. W. Hey-Groves won the Jacksonian prize in 1916.

DANGER FROM THE FIRE

WINTER brings danger of death by burning, especially to children and old people. Dr. Leonard Colebrook, F.R.S., writes to remind us that the peak period for serious accidents is from November to April. Since Oct. 1 it has been an offence for any person to sell or hire an electric or gas-fire, or an oil-burning space-heater, which is not fitted with a guard conforming to prescribed safety regulations; but the Act does not apply to fires already installed in people's houses, and, as Dr. Colebrook points out, there are about $4^1/_2$ million of these now in use, and about 12 million open solid fuel fires. Many—perhaps most—of these are not fitted with an adequate dress guard. A similar reminder from the London County Council says that every effort is being made—by posters, pamphlets, and working models, and through the teaching of health visitors—to warn mothers of young children of the risks they run by not providing guards. There are many new designs of guards at reasonable cost, and these are stocked by the large stores.

The London County Council, in a warning to citizens about the new law, points out that its public control committee now has the unenviable duty of deciding whether or not to prosecute parents or others in charge of children under 12 who have suffered serious or fatal accidents from any type of unguarded fire—not merely from coal fires, as used to be the case.

The commonest materials associated with burning accidents are cotton and artificial silk, both because they are ignited by short contact with a moderate heat, and because they propagate flames rapidly. They are the materials most commonly worn by women and children, and at present there is no completely satisfactory way of making them permanently non-flammable. Dr. Colebrook hopes, however, that before very long it will be possible to make them *much less* flammable, so that if they catch fire they will not cause any extensive burn. They would inevitably be a little more costly. Up to the present there has been little demand for them, so manufacturers have been reluctant to put them on the market. Housewives should be encouraged to ask for them in order to hasten the supply.

FRENCH WORK ON THE HEART AND BLOOD-VESSELS

WITH so much to read and so little time for reading, clinicians and laboratory-workers alike must pick and choose among the myriad articles poured out yearly by the scientific world; and what more natural than to choose first among those in their native tongues? It is only too easy to overlook or ignore work done in countries with other languages; and this is the cause of much unnecessary duplication of research. The Cultural Division of the French Embassy in the United States is doing something towards overcoming this difficulty by publishing in English bibliographical digests of French medical and scientific articles. The first of these digests[1] was published last December, for circulation in the U.S.A., and is available from the office of the Cultural Division of the Embassy.[2] It summarises over 500 articles on the heart and blood-vessels which appeared during 1945–51. Prof. René Leriche contributes a valuable review of cardiovascular surgery in France today. In a foreword Prof. André Cournand, professor of medicine in Columbia University, who—like Professor Leriche—is a member of the advisory board for the series, expresses his hope that the booklet will encourage American surgeons to familiarise themselves with current French work. Here we find it a little easier to keep in touch with our colleagues over the way; but the English are notoriously weak on languages, and these useful summaries will be as welcome here as they are in America.

1. French Bibliographical Digest, no. 1M. December, 1952.
2. 972, Fifth Avenue, New York City 21, N.Y., U.S.A.

University of St. Andrews

Sir Russell Brain, P.R.C.P., is to deliver the inaugural postgraduate lecture of the next session of the medical school, Dundee, on Thursday, Oct. 8. He is to speak on Consciousness and Unconsciousness.

Royal College of Obstetricians and Gynæcologists

Leverhulme research scholarships for 1954 have been awarded to Ian Donald, Joseph Gardiner, and Matthew Lindsay Paterson. The Blair-Bell lectureships for 1954 have been awarded to Thomas Everard Christopher Barns and Ian Donald.

Charing Cross Hospital

Admiral Sir Philip Vian will deliver the inaugural address of the medical school at 3 P.M. on Friday, Oct. 9, at the Royal College of Physicians, Pall Mall East, S.W.1.

Wessex Rahere Club

A dinner of this club will be held at the Lansdown Grove Hotel, Bath, on Saturday, Oct. 24. Membership of the club is open to all Barts men practising in the West Country. Further details may be had from Mr. A. Daunt Bateman, the hon. secretary, 11, The Circus, Bath.

American Society for the Study of Sterility

This society is offering an award of $1000 for an essay on infertility and sterility. The closing date is March 1, 1954. Further details may be had from Dr. Herbert H. Thomas, secretary of the society, 920, South 19th Street, Birmingham, Alabama.

Professional Nurses and Midwives Conference

This annual conference, which is held under the auspices of the *Nursing Mirror*, will take place at Seymour Hall, London, W.1, from Oct. 12 to 16 under the presidency of Sir William Gilliatt. Medical speakers will include Mr. Arnold Walker, Mr. R. C. Brock, Mr. A. B. Wallace, Sir Geoffrey Marshall, Dr. E. B. Strauss, Mr. Kenneth Bowes, Prof. A. M. Claye, Dr. Kenneth Maclean, and Prof. C. H. Gray.

International Orthopædic Congress

The sixth Congress of the International Society of Orthopædic Surgery and Traumatology will be held at Berne from Aug. 30 to Sept. 3, 1954. Subjects chosen for discussion include: Treatment of Scoliosis, Orthopædic and Traumatological Problems in Gerontology, Physiological Background of Maximal Performances in Sport, Arthrosis of the Hip, Osteo-articulatory Tuberculosis, Physiology and Pathology of Locomotion, and Surgery of the Hand. Further particulars may be had from the secretary-general of the society, M. Jean Delchef, 34, rue Montoyer, Brussels, Belgium.

Seminar on the United Nations Children's Fund

The World Federation of United Nations Associations is holding a seminar in Paris from Oct. 19 to 25 on the work of UNICEF. Dr. Charles A. Egger, director of the regional office of UNICEF, will give the opening address. The seminar is open to doctors, nurses, medical students, auxiliary medical personnel, social welfare workers, and others interested in child welfare. Further information may be had from the World Federation of United Nations Associations, 19, Avenue Kléber, Paris XVI.

Royal Victoria Hospital, Belfast

This hospital held a jubilee week from Sept. 20 to 27, to celebrate its years of service. On Sept. 24, at the ceremony of naming one of the wards in appreciation of the services of the honorary medical staff (1792–1948), Viscountess Brookborough unveiled a tablet honouring those who "served the people of Ulster by day and by night giving ungrudgingly of their knowledge and their skill for no fee and reward apart from the privilege of helping others."

During the week Lady Wakehurst opened the Herbert Quin department of neurosurgery and neurology, the first separate neurological unit in the province: Mr. C. A. Calvert has been appointed director of neurosurgery and Dr. R. S. Allison director of the department of neurology. The department, a two-floored pavilion, includes an operating and diagnostic centre, a 54-bedded unit, and 26 extra beds for the dermatological department. It has cost £70,000 and has been built out of free funds.

CORRIGENDUM: *The Work of a Regional Hospital.*—In this article by Dr. F. Avery Jones (Sept. 12, p. 556) Willesden General Hospital was stated to have 110 beds. In fact this hospital has 127 beds, and it has recently taken over an annexe with 35 beds for chronic sick.

Sir Rudolph Peters, F.R.S., has been awarded the degree of D.SC. by the University of Cincinnati.

Prof. Joseph Trueta has been appointed a chevalier of the Legion of Honour in recognition of his treatment of French wounded in Britain during the late war.

Sir Andrew Davidson, chief medical officer of the Department of Health for Scotland, in response to invitations from the Surgeon General of the United States Public Health Service, the deputy minister of health of Canada, and the American Public Health Association, is to visit the U.S.A. and Canada during November and the early part of December.

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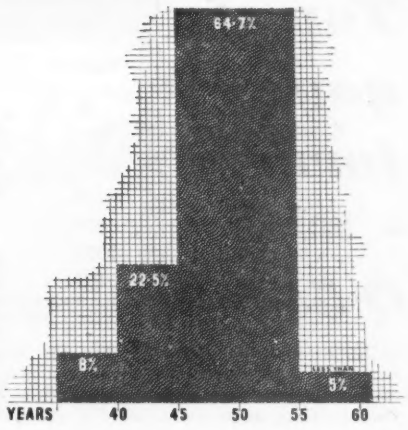

Graph showing percentages of average age of onset of menopause, drawn from figures compiled by the Council of Medical Women's Federation in England.

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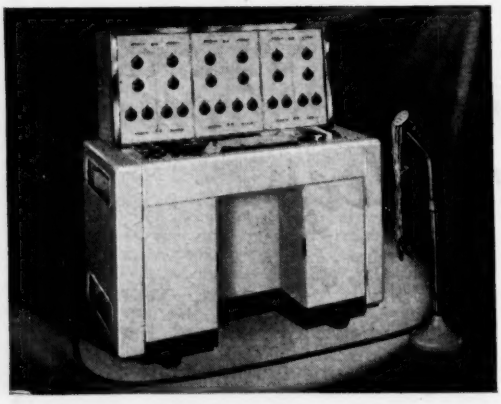

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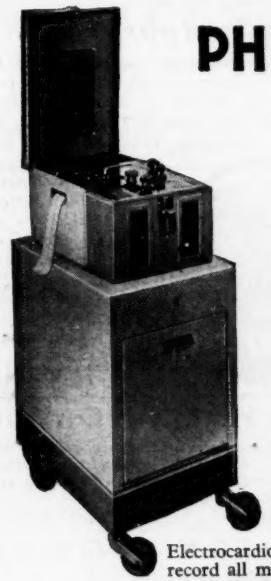

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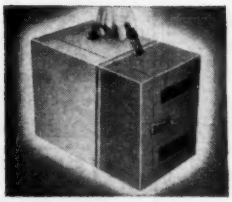

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The Terms and Conditions of Service of Hospital Medical and Dental Staff apply to all N.H.S. hospital posts we advertise, unless otherwise stated. Canvassing disqualifies, but candidates may normally visit the hospital by appointment.

Academic and Educational

EXAMINING BOARD IN ENGLAND

by the
ROYAL COLLEGE OF PHYSICIANS OF LONDON
and the
ROYAL COLLEGE OF SURGEONS OF ENGLAND

Notice is hereby given that the following Examinations will commence on the dates stated below :—

DIPLOMA IN PATHOLOGY
5th November
DIPLOMA IN TROPICAL MEDICINE AND HYGIENE
11th November
DIPLOMA IN ANÆSTHETICS
12th November
DIPLOMA IN LARYNGOLOGY AND OTOLOGY
3rd December
DIPLOMA IN PSYCHOLOGICAL MEDICINE
10th December
DIPLOMA IN INDUSTRIAL HEALTH
30th December

Applications and fees for either or both Parts of an Examination must reach the Secretary, Examination Hall, Queen-square, London, W.C.1, at least 21 days before Part I of the Examination begins.

FRANCIS M. STENT, Secretary.

UNIVERSITY OF LONDON

A LECTURE entitled "A Surmise on some Trends in Bacteriology" will be delivered by Prof. E. G. D. MURRAY (McGill University) at 5.30 P.M. on 12TH OCTOBER at University College Hospital Medical School, University-street, Gower-street, W.C.1. Admission free, without ticket.

JAMES HENDERSON, Academic Registrar.

THE LONDON HOSPITAL MEDICAL COLLEGE

COURSE IN ADVANCED MEDICINE

A Postgraduate Course in Medicine will be held at the London Hospital commencing MONDAY, 11TH JANUARY, and finishing FRIDAY, 19TH MARCH, 1954. Classes will be held on Mondays, Wednesdays, and Fridays. The Course will be limited to 24 students.

Applications should be made to the Dean. The fee for the whole course will be 35 guineas, and for Old Londoners 15 guineas.

H. B. MAY, M.A., M.D., M.R.C.P., Dean.
Turner-street, London, E.1.

EMPIRE RHEUMATISM COUNCIL

The AUTUMN WEEK-END COURSE will be held at The Arthur Stanley Institute, Middlesex Hospital, Peto-place, Marylebone-road, N.W.1 (Great Portland Street and Regent's Park Underground Stations), on FRIDAY and SATURDAY, 13TH and 14TH NOVEMBER, 1953.

LECTURE-DEMONSTRATIONS

Friday, 13th November

4.15 P.M.	Introduction	W. S. C. COPEMAN, O.B.E., F.R.C.P. (Chairman)
4.30 P.M.	Rheumatism in the Population	J. H. KELLGREN, F.R.C.P., F.R.C.S.
5.30 P.M.	Rheumatoid Arthritis	E. G. L. BYWATERS, F.R.C.P.

Saturday, 14th November

10.15 A.M.	Physical Methods in the Treatment of Rheumatic Diseases	H. A. BURT, F.R.C.P.
11.30 A.M.	Gout	G. R. FEARNLEY, M.R.C.P.
2 P.M.	The Intervertebral Disc	OSWALD SAVAGE, O.B.E., M.R.C.P.
3 P.M.	Orthopædic Aspects of the Rheumatic Diseases	J. C. R. HINDENACH, F.R.C.S.
4.15 P.M.	Osteo-arthritis	F. DUDLEY HART, F.R.C.P.

The fee for the course will be 2 guineas, limited to 60 entries, to be received with remittance, at least 1 week before by the General Secretary, Empire Rheumatism Council, Tavistock House (N), Tavistock-square, W.C.1.

WILLIAM MACKENZIE MEMORIAL

The WILLIAM MACKENZIE MEMORIAL LECTURE on "William Mackenzie: the making of an Ophthalmic Surgeon" will be delivered in the Hall of the Royal Faculty of Physicians and Surgeons, 242, St. Vincent-street, Glasgow, on FRIDAY, 30TH OCTOBER, 1953, at 5 P.M.

By Dr. JOHN MARSHALL, Glasgow,

to whom the William Mackenzie Memorial Medal will be presented.

Chairman A. J. Ballantyne, Esq., LL.D.

Medical practitioners are cordially invited to be present.

UNIVERSITY OF LONDON. The Senate invite applications for the READERSHIP IN CHILD HEALTH tenable at the Institute of Child Health (salary within the range £1500–£2000 a year).

Applications (10 copies) must be received not later than 27th October, 1953, by the Academic Registrar, University of London, Senate House, W.C.1, from whom further particulars should be obtained.

UNIVERSITY OF LONDON. The Senate invite applications for the READERSHIP IN MEDICINE tenable at the London Hospital Medical College (salary within the range £1500–£2000 a year).

Applications (10 copies) must be received not later than 29th October, 1953, by the Academic Registrar, University of London, Senate House, W.C.1, from whom further particulars should be obtained.

THE ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE

THE CERTIFICATE, AND THE DIPLOMA, IN PUBLIC HEALTH, AND THE DIPLOMA IN INDUSTRIAL HEALTH

The bi-annual Course of Instruction for the Certificate in Public Health (C.P.H.) commenced on 2ND OCTOBER, 1953, though applications can still be considered if received within the next 10 days. This leads to Courses both for the Diploma in Public Health and for the Diploma in Industrial Health. All Courses may be taken either whole time or part time.

Prospectuses, enrolment forms and full details may be obtained from the Secretary, 28, Portland-place, London, W.1. (Telephone : LANgham 2731/2.)

ROYAL FREE HOSPITAL SCHOOL OF MEDICINE, Hunter-street, London, W.C.1. Applications are invited from registered medical practitioners (Men or Women) for the appointment from 1st January, 1954, of LECTURER IN BACTERIOLOGY AND HONORARY ASSISTANT PATHOLOGIST to the Royal Free Hospital Teaching Group. Duties include both teaching and hospital diagnostic routine. 2 or 3 years experience in bacteriology essential. Salary £900–£100–£1100 p.a. with superannuation benefits and family allowances.

Applications (9 copies), stating age, qualifications and experience, with 9 copies of 3 testimonials, to be sent to the Secretary at the above address not later than 17th October, 1953.

BRITISH EMPIRE CANCER CAMPAIGN invites applications from British subjects for EXCHANGE FELLOWSHIPS IN CANCER RESEARCH offered by the National Cancer Institute of Canada. Fellowships are of 1 years tenure at a stipend of $4000. Travelling expenses to and from centre of work will be borne by the Campaign.

For further particulars and application forms, apply to the Secretary-General, British Empire Cancer Campaign, 11, Grosvenor-crescent, Hyde Park Corner, London, S.W.1. Completed applications must be received by 15th November, 1953.

THE UNIVERSITY OF SHEFFIELD. Applications are invited for the following full-time posts :—

(1) LECTURER IN CHILD HEALTH.
(2) TUTOR IN CHILD HEALTH.

The Lecturer will be required to begin duties on 1st January, 1954, or earlier if arrangements can be made and the Tutor on 1st December, 1953. Arrangements will be made for the Lecturer to have official clinical status and responsibilities in the Children's Hospital, Sheffield. A candidate for the Lectureship should be a Member of the Royal College of Physicians of London. Salary scales : Lecturer £700–£100–£1500 ; Tutor £700–£1300. The initial salary on either scale will depend on qualifications and experience. There will be superannuation provision under the F.S.S.U. and family allowance.

Applications (4 copies), together with the names and addresses of 3 referees and, if desired, copies of testimonials, should be sent to the undersigned (from whom further particulars may be obtained) not later than 10th October, 1953.

A. W. CHAPMAN, Registrar.

THE UNIVERSITY OF MANCHESTER. Darbishire HOUSE HEALTH CENTRE. Applications are invited from candidates with medical qualifications registrable in this country for the post of READER or SENIOR LECTURER IN SOCIAL MEDICINE. The person appointed will act as Liaison Officer at Darbishire House Health Centre. Salary scales : Reader, £1800–£100–£2250 p.a. Senior Lecturer, £1800–£100–£2000 p.a. Initial salary according to qualifications and experience. Membership of F.S.S.U. and Children's Allowance Scheme.

Applications should be sent not later than 17th October, 1953, to the Registrar, The University, Manchester, 13, from whom further particulars and forms of application may be obtained.

UNIVERSITY OF BELFAST. Applications are invited for a post of SCIENTIFIC OFFICER (biochemistry) at the Queen's University of Belfast for research in problems in children. The appointment will date from 1st October, 1953, or such later date as may be agreed. The appointment will be held at the Royal Belfast Hospital for Sick Children (200 Beds). Salary not less than £900.

Applications should be submitted by 30th November, 1953. Further particulars from G. R. COWIE, M.A., LL.B., Secretary.

WORLD HEALTH ORGANIZATION. Applications are invited from candidates with higher medical qualifications and specialist experience in pædiatrics for the post of PÆDIATRICIAN to work in the All-India Institute of Hygiene and Public Health, Calcutta. Candidates should be over 35 years of age, and should have ability to teach in English at both undergraduate and postgraduate levels. The selected candidate will be appointed by W.H.O. as 1 of a team of 8 international staff who will work with national counterpart staff in the Department of Maternal and Child Health of the Institute. The Pædiatrician will also collaborate with the Professor of Pædiatrics in the Medical College for clinical studies in pædiatrics. He (or she) should preferably have a public-health qualification, and should be particularly interested in the social and public-health aspects of pædiatrics. Previous experience in a tropical country would be an advantage, but is not essential. The initial contract would be for a period of 2 years with a salary approximately equivalent to 7300 U.S. dollars p.a., plus allowances.

Further information can be obtained from the Chief, Personnel Section, World Health Organization, Geneva, to whom written applications should be addressed.

Hospital Services : Senior Appointments

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Whole-time Locum ANÆSTHETIST for the Salisbury Group for approximately 5 weeks from 1st October, 1953. Remuneration 45 guineas per week (if holding National Health Service Consultant grading) or 31½ guineas per week.

Apply immediately to Dr. J. REVANS.
Beeston House, Water-lane, Winchester.

LIVERPOOL REGIONAL HOSPITAL BOARD. North WIRRAL AREA. Applications are invited for the post of VISITING CONSULTANT PHYSICIAN for 3 notional half-days weekly. The successful applicant will be required to attend at Caldy Manor Hospital, Wirral (2 sessions), and Victoria Central Hospital, Wallasey (1 session).

Application forms from, and to be returned to, Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received not later than 24th October, 1953.

VINCENT COLLINGE, Secretary to the Board.

LEEDS REGIONAL HOSPITAL BOARD invite applications for the post of Locum Tenens CONSULTANT in Anæsthetics for duties in the Thoracic Surgical Unit at the Castle Hill Sanatorium, Hull. The post will be tenable for a period of approximately 6 months commencing on 12th October, 1953, or as soon as available thereafter.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names of 3 referees, should be forwarded to the Secretary, Park-parade, Harrogate, as soon as possible.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of ASSISTANT SENIOR MEDICAL OFFICER on the Headquarters staff of the Board. Salary £1500–£75(4)–£100–£1900 p.a. The successful candidate will be required to devote the whole of his time to his duties and to assist the Senior Administrative Medical Officer with the organisation, planning, and development of the Hospital and specialist services in the Region.

Applications, with particulars of age, qualifications, and experience, together with the names and addresses of 3 referees, should be sent to the Senior Administrative Medical Officer, Cheetwood-road, Manchester, 8, by 19th October, 1953.

NEWCASTLE REGIONAL HOSPITAL BOARD. Middlesbrough Maternity Hospital. (64 Beds.) TEES-SIDE HOSPITAL MANAGEMENT COMMITTEE GROUP. ASSISTANT OBSTETRICIAN required for the above Hospital. Salary scale £1300–£1750. The appointee will be required to reside in close proximity to the Middlesbrough Maternity Hospital, and will work, if required, in peripheral antenatal clinics. Further particulars may be obtained from the Senior Consultant Obstetrician and Gynæcologist, Middlesbrough Maternity Hospital. A flat may be available in the nurses' home if a lady doctor is appointed.

Applications, together with names and addresses of referees (preferably), or testimonials, to a total of 3, to be sent to the Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 28 days.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for appointments as Part-time CONSULTANT E.N.T. SURGEONS at :—

(1) Chelmsford and Essex and St. John's Hospitals, Chelmsford (4 sessions a week).
St. Margaret's Hospital, Epping (2 sessions a week).
Ware Park Hospital, Herts (1 session a month).
Honey Lane Hospital, Waltham Abbey, Essex (as required).
This is a combined appointment with a requirement that the person appointed should reside in the area.
(2) North Middlesex Hospital, N.18 (4 sessions a week).
(3) Queen Mary's Hospital for the East End, Stratford, E.15 (2 sessions a week).
(4) Bethnal Green Hospital, E.2 (2 sessions a week).

Separate applications (6 copies), indicating post concerned and detailing private address, date of birth, qualifications and experience, present appointment(s) (including number of sessions) and grade, and names of 3 referees, should reach the Secretary, 11A, Portland-place, London, W.1, by Saturday, 17th October, 1953.

STOKE-ON-TRENT GROUP OF HOSPITALS. Part-time CONSULTANT ANÆSTHETIST (9 notional half-days weekly). Duties mainly at City General Hospital, Stoke-on-Trent (938 Beds). Non-resident. Experience in anæsthetics for chest diseases an advantage. Possession of D.A. required.

Applications (15 copies), stating name, age, nationality, qualifications, present and previous appointments, and details of 3 refgrees, to Secretary, Birmingham Regional Hospital Board, 10, Augustus-road, Birmingham, 15, before 19th October, 1953.

SHEFFIELD REGIONAL HOSPITAL BOARD. Maximum Part-time CONSULTANT CHILDREN'S PSYCHIATRIST required for South Lincolnshire.

Application forms and further details obtainable from the Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 24th October, 1953.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD invite applications for the post of CONSULTANT PÆDIATRICIAN (whole-time). The whole-time nature of the appointment will be subject to review after 3 years.

Schedules of application, obtainable from the undersigned, who will also supply further particulars, should be lodged by 31st October, 1953. A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore Hospital, Inverness.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR OPHTHALMOLOGIST at Dundee Royal Infirmary. There are attached to the post duties at other hospitals and clinics in the Dundee and Angus area. The appointment will be part-time and remunerated on the basis of 8 notional half-days per week. There will be associated with the post the appointment of Lecturer in Ophthalmology in the University of St. Andrews. Salary in accordance with the main scale for Consultants. Other conditions of service in accordance with National agreement.

Forms of application and further particulars from the Secretary to the Board, "Braeknowe," 430, Blackness-road, Dundee, with whom applications must be lodged not later than 3rd November, 1953.

NORTHERN IRELAND HOSPITALS AUTHORITY invite applications for 2 part-time posts as CONSULTANT ANÆSTHETIST. 1 post is at hospitals managed by the Belfast Hospital Management Committee and the other at hospitals managed by the South Belfast Hospital Management Committee. If deemed necessary by the Authority the successful applicants will also be required to undertake duty at other hospitals in or near Belfast. The terms and conditions of the appointments will be in accordance with the Authority's application of the Spens Report to Northern Ireland.

Applications should be made on a form which may be obtained (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, Friends' Provident Building, 58, Howard-street, Belfast, and will be received not later than 26th October, 1953.

NORTHERN IRELAND HOSPITALS AUTHORITY invite applications for a whole-time post as CONSULTANT RADIOLOGIST with headquarters at Londonderry. The terms and conditions of the appointment will be in accordance with the Authority's application of the Spens Report to Northern Ireland.

Applications should be made on a form which may be obtained (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, Friends' Provident Building, 58, Howard-street, Belfast, and which must be returned not later than 26th October, 1953.

NORTHERN IRELAND TUBERCULOSIS AUTHORITY. MASS RADIOGRAPHY SERVICE. Applications are invited for the post of MEDICAL DIRECTOR of the Mobile Mass Radiography Unit which will operate throughout Northern Ireland. As the Unit is fully diagnostic, applicants must have wide experience in the diagnosis and treatment of tuberculosis and other chest diseases. Possession of a higher medical degree is desirable. The salary scale for the post is £1300–£50–£1750 p.a.

Forms of application and conditions of appointment may be obtained from the Secretary, Northern Ireland Tuberculosis Authority, 27, Adelaide-street, Belfast, with whom completed applications should be lodged not later than 18th October, 1953.

Hospital Services : Junior Appointments

BATTERSEA GENERAL HOSPITAL, Battersea Park, S.W.11. CASUALTY OFFICER/HOUSE SURGEON (resident). House Officer or Senior House Officer grade, according to experience.

Appiy, enclosing copies of 2 recent testimonials, to Hospital Secretary (L).

BATTERSEA GENERAL HOSPITAL, Battersea Park, S.W.11. Locum RESIDENT SURGICAL OFFICER (Junior Hospital Medical Officer grade), 9th–25th October.

Apply Hospital Secretary (tel. : BATtersea : 0134).

BATTERSEA GENERAL HOSPITAL, Battersea Park, S.W.11. RESIDENT SURGICAL OFFICER (Junior Hospital Medical Officer grade) from 4th November.

Apply Hospital Secretary (L), enclosing copies of 2 recent testimonials.

BEARSTED MEMORIAL HOSPITAL (Jewish Maternity Hospital), Lordship-road, N.16. RESIDENT OBSTETRIC HOUSE OFFICER (third post) required at above Hospital, on or after 1st October, 1953. Obstetric experience an advantage but not essential. Post recognised for the D.Obst.R.C.O.G.

Application forms from the Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, which should be returned at once.

BETHNAL GREEN HOSPITAL, Cambridge Heath-road, London, E.2. (General—313 Beds.) Applications are invited from registered medical practitioners for the post of HOUSE PHYSICIAN. Salary £350, £400, or £450 p.a., depending on experience, less £100 p.a. residential charges.

Applications, stating age, nationality, qualifications and experience, with copies of 3 testimonials, to the Hospital Secretary immediately.

BROMPTON HOSPITAL, S.W.3. Applications invited for the post of ASSISTANT RESIDENT MEDICAL OFFICER (Senior House Officer grade). Appointment is for 6 months from 1st November. Experience in artificial pneumothorax essential and in E.N.T. work desirable.

Applications, stating age, qualifications with dates, nationality, and appointments held, together with copies of testimonials, by 17th October to KENNETH A. F. MILES, House Governor.

BROMPTON HOSPITAL, S.W.3. Applications are invited for the post of NON-RESIDENT HOUSE PHYSICIAN for which there are 3 vacancies, for 6 months from 1st December. Duties include work in Outpatient Department and wards. Salary £400 or £450 a year, according to experience.

Applications, stating age, qualifications with dates, nationality and appointments held, together with copies of testimonials, by 10th October to KENNETH A. F. MILES, House Governor.

CENTRAL MIDDLESEX HOSPITAL, N.W.10. North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR (resident), required at above Hospital. Recognised for D:A. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, Central Middlesex Group Hospital Management Committee, Central Middlesex Hospital, Park Royal, N.W.10, by 17th October, 1953.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. SENIOR HOUSE OFFICER in General Medicine required with duties mainly in the Geriatric Department. Good facilities for higher examination and insight into working of general practice. Whole-time appointment for 6 months in first instance. Post vacant 6th November, 1953.

Applications, with copies of 2 testimonials, to Medical Director by 17th October, 1953.

CAMBERWELL HOSPITALS MANAGEMENT COMMITTEE. ST. GILES' HOSPITAL, Camberwell, London, S.E.5. Applications invited for appointment as HOUSE OFFICER (surgical duties). Position vacant now. Salary £350–£450 a year, according to posts held, less £100 a year in respect of residence. Recognised pre-registration post.

Applications, stating age, qualifications and experience, enclosing copy testimonials to the Secretary, Camberwell Hospitals Management Committee, Dulwich Hospital, S.E.22.

CAMBERWELL HOSPITALS MANAGEMENT COMMITTEE. DULWICH HOSPITAL, East Dulwich, London, S.E.22, and ST. GILES' HOSPITAL, Camberwell, London, S.E.5. Applications invited for appointments as SENIOR HOUSE OFFICERS (duties: anæsthetics). Resident appointments for duties in the Camberwell Group of hospitals. 2 posts, 1 vacant now, 1 from 19th October. Recognised for D.A.

Applications, stating age, qualifications, and posts held, enclosing copy testimonials, to the Group Secretary, Camberwell Hospitals Management Committee, Dulwich Hospital, East Dulwich-grove, S.E.22.

DREADNOUGHT SEAMEN'S HOSPITAL, Greenwich, S.E.10. (General Hospital of 147 Beds.) HOUSE SURGEON (pre-registration post) required immediately. Post recognised by Royal College of Surgeons.

Applications, stating age, qualifications and experience, with the names of 3 referees, to the undersigned as soon as possible and not later than 11th October. F. A. LYON, Secretary.

Dreadnought Seamen's Hospital, Greenwich, S.E.10.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. ROYAL FREE HOSPITAL GROUP. Applications are invited from registered Women medical practitioners for the appointment of JUNIOR RESIDENT ASSISTANT PATHOLOGIST. Salary in accordance with the Ministry of Health scale for House Officers. The appointment is for 6 months in the first instance, duties to commence 1st December, 1953.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 14th October, 1953.

EAST HAM MEMORIAL HOSPITAL, Shrewsbury-road, London, E.7. Applications are invited for the post of HOUSE SURGEON (House Officer, first or second post), Male or Female, for 6 months commencing as soon as possible. This post is recognised for the F.R.C.S.

Applications, stating age and experience, together with copies of testimonials, should be sent to the Group Secretary, West Ham Group Hospital Management Committee, London, E.15, not later than 10th October, 1953.

GROUP PATHOLOGICAL LABORATORY, St. Mary ABBOTS HOSPITAL, Marloes-road, Kensington, W.8., SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. FULHAM AND KENSINGTON HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for appointment as REGISTRAR (pathology), vacant 1st January, 1954, at above Laboratory. Candidates may visit the Laboratory by arrangement with the Director of Pathology.

Applications (5 copies are required to be completed) to be submitted by 16th October, 1953, on forms obtainable from the Group Secretary (L.142), Fulham and Kensington Hospital Management Committee, 5, Collingham-gardens, London, S.W.5.

GROUP LABORATORY. MILE END HOSPITAL, Bancroft-road, London, E.1. RESIDENT ASSISTANT PATHOLOGIST (Senior House Officer). Previous experience an advantage, but not essential. Laboratory recognised for Diploma of Pathology. Salary £670 p.a., less £156 p.a. for residence. Post tenable for 1 year in first instance.

Applications, stating age, nationality, qualifications and experience, together with names of 2 referees, to the Secretary, Stepney Group Hospital Management Committee, Raine-street, Wapping, E.1.

HAMMERSMITH HOSPITAL AND POSTGRADUATE MEDICAL SCHOOL, Ducane-road, London, W.12. REGISTRAR (Department of Medicine) required immediately.

Applications, stating age, qualifications, experience, names of 2 referees, to Secretary, Board of Governors, by 10th October.

HAMMERSMITH HOSPITAL AND POSTGRADUATE MEDICAL SCHOOL, Ducane-road, London, W.12. SENIOR HOUSE OFFICER (anæsthetics) required immediately.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials, to Secretary, Board of Governors, by 10th October.

HAMMERSMITH HOSPITAL AND POSTGRADUATE MEDICAL SCHOOL, Ducane-road, London, W.12. HOUSE SURGEON (radiotherapy) required 1st December.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials, to Secretary, Board of Governors, by 17th October.

HIGHLANDS HOSPITAL, Winchmore Hill, N.21. (General Hospital—818 Beds.) SENIOR HOUSE OFFICER (resident) for T.B. Unit (100 Beds).

Applications, with copies of 3 testimonials, to Hospital Secretary.

LONDON JEWISH HOSPITAL, Stepney Green, E.1. (130 Beds.) Applications invited for the post of RESIDENT SENIOR HOUSE OFFICER (Surgical Department), vacant 1st October, 1953. Salary £670 p.a. is subject to deduction at rate of £156 p.a. for board, lodging, &c.

Applications with copies of testimonials, to the Secretary at the Hospital.

LONDON JEWISH HOSPITAL, Stepney-green, E.1. Applications invited for the post of RESIDENT HOUSE SURGEON, vacant October, 1953. Tenable for 6 months, renewable. Salary £350, £400, or £450 p.a., according to experience, subject to deduction at the rate of £100 for board, lodging, &c.

Applications, with copies of testimonials, to the Secretary at the Hospital.

HACKNEY HOSPITAL, London, E.9. (General—807 Beds.) 2 CASUALTY HOUSE OFFICERS (6 months appointments) are required, 1 to act also as House Officer to the E.N.T. Department and 1 as House Officer to the Skin Department.

Applications from second or third post candidates should reach the Group Secretary, Hackney Hospital Management Committee, London, E.9, as soon as possible, stating for which post application is made.

LONDON CHEST HOSPITAL. Hospitals for Diseases OF THE CHEST. Applications are invited for the post of Full-time MEDICAL REGISTRAR (Registrar grade). The appointment is for 1 year in the first instance and is non-resident. Duties include attendance at Country Branch, near Letchworth.

Applications, stating age, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should reach the House Governor, not later than 16th October, 1953.

LONDON CHEST HOSPITAL. Hospitals for Diseases OF THE CHEST. A vacancy occurs 1st December, 1953, for RESIDENT SURGICAL OFFICER. Appointment for 6 months (with prospect of renewal), of which 2 will be at the Country Branch, near Letchworth. Post graded as Senior House Officer or Registrar, according to qualifications and experience. Previous surgical experience necessary.

Applications, stating age, qualifications with dates and previous appointments held, with copies of 3 testimonials, should reach the undersigned not later than 16th October.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

LONDON CHEST HOSPITAL. Hospitals for Diseases OF THE CHEST. 2 vacancies occur 1st December, 1953, for RESIDENT HOUSE PHYSICIAN. Appointments for 6 months, 4 in London, 2 at the Country Branch, near Letchworth, and posts are graded as House Officer. Duties include work in the Outpatient Department and Refill Clinic as well as in wards.

Applications, stating age, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should reach the undersigned not later than 16th October.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

MANOR HOUSE HOSPITAL, Golders Green, N.W.11. (Exempted from National Health Service.) Required, RESIDENT SURGICAL OFFICER (Male). Salary £670 p.a., less £100 p.a. deducted for emoluments. 6 months appointment, renewable.

Applications, stating age, nationality, qualifications, and surgical or orthopædic experience, with copies of 3 testimonials, to—

W. F. PENDRILL, Secretary.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) REGISTRAR in Obstetrics and Gynæcology (resident), Forest Gate Hospital, London, E.7. Post recognised for M.R.C.O.G. Candidates must have previous experience.

(2) REGISTRAR in Medicine (resident or non-resident), Thurrock and other hospitals in S.E. Essex Group. Single accommodation available. Post offers widest experience in all phases of medicine, including infectious diseases and tuberculosis.

(3) REGISTRAR in General Medicine and Tuberculosis (resident or non-resident sleeping-in on duty), St. George-in-the-East Hospital, London, E.1 (38 general medical and 32 male tuberculosis beds).

(4) REGISTRAR in Medicine (resident or non-resident), Wanstead Hospital, London, E.11.

(5) REGISTRAR in Medicine (resident), St. Michael's Hospital, Braintree, Essex. Furnished flat available.

(6) REGISTRAR in Anæsthetics (resident), Chelmsford and Essex and St. John's Hospital, Chelmsford, Essex. Post recognised for the D.A.

(7) REGISTRAR in Anæsthetics (resident), Poplar Hospital, London, E.14. Preference will be given to candidates holding the D.A.

(8) REGISTRAR in Geriatrics (resident), St. Matthew's Hospital, London, N.1. Experience in surgery and orthopædics desirable.

(9) REGISTRAR in Pædiatrics (non-resident), Southend-on-Sea Group of hospitals, Essex. Previous pædiatric experience essential. Holder of M.R.C.P. and/or D.C.H. preferred.

(10) E.N.T. REGISTRAR (non-resident), Whipps Cross Hospital, London, E.11.

(11) REGISTRAR in Pathology (resident or non-resident), St. John's Hospital, Chelmsford, Essex. Some duties at Chelmsford and Essex Hospital. Knowledge of morbid anatomy an advantage.

Appointments subject to review after 1 year.

Separate applications in duplicate, detailing date of birth, qualifications, experience, present appointment, grade and salary with 2 copies of 2 recent testimonials, to Secretary, 11A, Portland-place, W.1, by 17th October, 1953.

NEW CROSS GENERAL HOSPITAL, Avonley-road, S.E.14. BERMONDSEY AND SOUTHWARK GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER for duties in connection with Outpatient Clinics and Wards (medical and surgical) under the care of the Consultant staff of Guy's Hospital.

Applications, with names of 2 referees, to Group Secretary.

QUEEN ELIZABETH HOSPITAL FOR CHILDREN MANAGEMENT COMMITTEE, Hackney-road, E.2, Shadwell, E.1, and BANSTEAD WOOD, SURREY. HOUSE OFFICERS (2). These appointments will be made for 2 consecutive periods of 6 months commencing 1st December, 1953. First appointment as House Physician and second as House Surgeon and Casualty Officer in each case.

Application forms may be obtained from the Secretary at Hackney Road and should be returned with copies of not more than 3 testimonials on or before 24th October, 1953.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. Applications are invited from registered medical practitioners for the post of RESIDENT PÆDIATRIC HOUSE PHYSICIAN (third post) for a period of 6 months commencing 14th December, 1953. Post recognised for D.C.H.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, to be returned by 7th November, 1953.

PRINCE OF WALES'S GENERAL HOSPITAL. (219 Beds.) Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER RESIDENT SENIOR HOUSE SURGEON, for a period of 6 months, vacant 8th December, 1953.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, to be returned by 7th November, 1953.

PRINCE OF WALES'S GENERAL HOSPITAL. (219 Beds.) Applications are invited from registered medical practitioners for the appointment of RESIDENT SENIOR HOUSE SURGEON (third post), for a period of 6 months, vacant 14th December, 1953.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, to be returned by 7th November, 1953.

PRINCE OF WALES'S GENERAL HOSPITAL. (219 Beds.) Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER RESIDENT SENIOR HOUSE SURGEON for Casualty, for a period of 6 months, vacant 4th December, 1953.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, to be returned by 7th November, 1953.

PRINCE OF WALES'S GENERAL HOSPITAL. (219 Beds.) Applications are invited from registered medical practitioners for the appointment of RESIDENT GYNÆCOLOGICAL HOUSE SURGEON (third post), for a period of 6 months, vacant 29th December, 1953.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, to be returned by 7th November, 1953.

PRINCESS BEATRICE HOSPITAL, Earls Court, S.W.5. REGISTRAR (general medicine). 3 half-days per week, Tuesday A.M. and P.M., Friday P.M. Immediate vacancy.

Application forms from Group Secretary, St. Luke's Hospital, Chelsea, S.W.3. Enclose foolscap stamped addressed envelope.

QUEEN CHARLOTTE'S AND CHELSEA HOSPITALS FOR WOMEN. HOUSE SURGEON (Senior House Officer). Resident post for 1 year from 1st December, 1953.

Applications to be sent to the Secretary to the Board of Governors by 14th October, 1953, on forms obtainable from 339, Goldhawk-road, London, W.6.

QUEEN CHARLOTTE'S AND CHELSEA HOSPITALS. RESIDENT ANÆSTHETIST (Senior House Officer). Resident post tenable for 6 months from 1st January, 1954, in the first instance, for duties at both Hospitals.

Applications to be sent to the Secretary to the Board of Governors by 14th October, 1953, on forms obtainable from 339, Goldhawk-road, London, W.6.

QUEEN CHARLOTTE'S MATERNITY HOSPITAL. JUNIOR OBSTETRICS OFFICER (Senior House Officer). Resident post tenable for 6 months from 1st January, 1954.

Applications to the Secretary to the Board of Governors by 14th October, 1953, on forms obtainable from 339, Goldhawk-road, London, W.6.

QUEEN CHARLOTTE'S MATERNITY HOSPITAL. SENIOR HOUSE OFFICER in the Pædiatric Department. Resident post tenable for 6 months from 1st January, 1954, in the first instance. Duties will include supervision of the babies, research work under the Visiting Staff, and charge of the follow-up Infants Clinic. Previous experience at a Children's Hospital is essential and possession of a higher qualification is desirable.

Applications to be sent to the Secretary to the Board of Governors by 14th October, 1953, on forms obtainable from 339, Goldhawk-road, London, W.6.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, E.15. Applications are invited for the appointment of CASUALTY OFFICER AND DEPUTY RESIDENT SURGICAL OFFICER (Male or Female), Senior House Officer grade, for 1 year commencing as soon as possible. The post is recognised for the F.R.C.S.

Candidates should send applications, together with copies of 2 recent testimonials, to the Group Secretary, West Ham Group Hospital Management Committee, Stratford, E.15, by 8th October, 1953.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, E.15. HOUSE PHYSICIAN (Male or Female) required (third post) for 6 months commencing 5th November, 1953.

Applications, with copies of recent testimonials, to Group Secretary, West Ham Group Hospital Management Committee, Stratford, E.15, by 14th October, 1953.

ROYAL NORTHERN HOSPITAL, Holloway, N.7. Applications are invited for the post of SENIOR HOUSE OFFICER (ophthalmology, E.N.T., and radiotherapy). Salary £670 p.a., less £130 for residential emoluments.

Applications, stating qualifications, and experience, with copies of 3 recent testimonials, to be sent to the Hospital Secretary as soon as possible.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Great Portland-street, London, W.1. Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER for a period of 6 months; duties to commence 14th November.

Applications to be received not later than 12th October. Forms of application can be obtained from the House Governor at 234, Great Portland-street, London, W.1.

ROYAL FREE HOSPITAL GROUP. Applications are invited for the post of REGISTRAR to the X-ray Department of the Royal Free Hospital. Duties to commence on 1st January, 1954. Appointment for 1 year in the first instance. Candidates should be registered medical practitioners of not more than 10 years standing, and should hold the D.M.R.(D.).

Application forms may be obtained from the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 24th October, 1953.

ROYAL FREE HOSPITAL GROUP. Applications are invited for the post of SENIOR REGISTRAR to the X-ray Department at the Royal Free Hospital. Duties to commence on 1st January, 1954. Appointment for 1 year in the first instance. Candidates should be registered medical practitioners of not more than 10 years standing, and should hold the D.M.R.(D.). The present Locum is an applicant for the post.

Formal applications, giving details of experience, &c., together with the names of 3 referees, should be sent to the Secretary to the Board of Governors, The Royal Free Hospital, Gray's Inn-road, W.C.1, not later than 24th October, 1953.

ST. STEPHEN'S HOSPITAL, Fulham-road, S.W.10. REGISTRAR (general medicine), non-resident. Vacancy 19th October, 1953.

Application forms from Group Secretary, St. Luke's Hospital, Chelsea, S.W.3. Enclose foolscap stamped addressed envelope.

ST. BARTHOLOMEW'S HOSPITAL, E.C.1. A vacancy will arise on 1st January, 1954, for a RESIDENT DENTAL HOUSE SURGEON, holding a dental qualification with, if possible, an additional qualification. The appointment, which is recognised by the Royal College of Surgeons for purposes of the Fellowship in Dental Surgery, will be for 6 months in the first instance, and the holder will gain experience in all branches of dental and oral surgery.

Applications should be submitted to the undersigned by 7th November, 1953.

C. C. CARUS-WILSON, Clerk to the Governors.

ST. MARK'S HOSPITAL, City-road, London, E.C.1. Applications invited from Senior Registrars who have completed their training, or from Registrars who have completed their appointments, for the post of RESIDENT SURGICAL OFFICER. Salary at the rate of £1300 or £890 p.a. respectively. Appointment tenable 6 months from 1st January with possibility of further extension 6 months.

Applications, stating age, qualifications, experience, names of 2 referees, to Secretary, Board of Governors, The Hammersmith, West London, and St. Mark's Hospitals, Ducane-road, London, W.12, by 17th October.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. Applications are invited from pre-registration and registered Women medical practitioners for the post of HOUSE PHYSICIAN vacant on 2nd December, 1953. The appointment will be for a period of 6 months.

For forms of application apply to the Secretary at the Hospital as soon as possible.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. Applications are invited from pre-registration and registered Female medical practitioners for the appointment of HOUSE SURGEON, vacant now. The appointment is for a period of 6 months.

For form of application apply to the Secretary at the Hospital.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy for a HOUSE SURGEON to the E.N.T. Department (Senior House Officer) on 1st January, 1954.

Further particulars and form of application, which must be returned not later than Monday, 2nd November, 1953, may be obtained from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy on 6th January, 1954, for an ASSISTANT RESIDENT MEDICAL OFFICER (grade—Senior House Officer) at the Country Branch Hospital, Tadworth, Surrey (101 Beds).

Further particulars and form of application, which must be returned not later than Monday, 2nd November, 1953, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be vacancies on 15th January, 1954, for the following Senior House Officers :—

2 HOUSE PHYSICIANS.
2 HOUSE SURGEONS.

Further particulars and form of application, which must be returned not later than 2nd November, 1953, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy on 18th November, 1953, for a RESIDENT DENTAL HOUSE SURGEON (Senior House Officer). Salary £670 p.a. The post is recognised for the Fellowship in Dental Surgery, Royal College of Surgeons. Experience is given in both oral surgery and orthodontics.

Further particulars and form of application, which must be returned not later than 19th October, 1953, may be obtained from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy for a Whole-time ASSISTANT MEDICAL REGISTRAR (Registrar grade) on 10th December, 1953.

Further particulars and form of application, which must be returned not later than Monday, 12th October, 1953, may be obtained from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy on 15th November, 1953, for a HOUSE SURGEON to the Orthopædic and Plastic Departments (Senior House Officer).

Further particulars and form of application, which must be returned not later than 19th October, 1953, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

WHITTINGTON HOSPITAL, London, N.19. North West METROPOLITAN REGIONAL HOSPITAL BOARD. PÆDIATRIC REGISTRAR required at above Hospital. Unit contains 58 Beds which includes 20 Beds for the treatment of tuberculous meningitis in addition to 64 neonatal cots. Post vacant 1st October, 1953. Hospital may be visited by appointment with the Medical Superintendent.

Application forms obtainable from, and returnable to, Secretary, Archway Group Hospital Management Committee, 46, Cholmeley-park, Highgate, N.6, by 12th October, 1953.

WEST LONDON HOSPITAL, Hammersmith-road, W.6. HOUSE SURGEON (general and gynæcological) required 1st December.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials, to Secretary by 14th October.

WEST END HOSPITAL FOR NERVOUS DISEASES. SENIOR HOUSE OFFICER (Neurosurgical Assistant) required for the West End Unit housed at St. Charles' Hospital, Ladbroke-grove, W.10. Candidates should have had surgical experience, and previous neurological or neurosurgical experience an advantage.

Applications, stating age, qualifications, experience, together with the names and addresses of 3 referees, to reach the Hospital Secretary, 73, Welbeck-street, W.1, by 8th October.

AYLESBURY. ROYAL BUCKINGHAMSHIRE AND ASSOCIATED HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for the following appointments :—

Royal Buckinghamshire Hospital

SENIOR HOUSE OFFICER to Accident and Orthopædic Department (which is centred upon this Hospital and comprises 48 Beds), vacant now.

Applications for the above appointment, with 2 testimonials, to Secretary-Superintendent as soon as possible.

Tindal General Hospital

RESIDENT SURGICAL OFFICER (Senior House Officer), vacant 12th October, 1953. The Surgical Unit consists of 100 Beds and undertakes all the general surgery for the area. The post offers excellent training in practical surgery, and is eminently suitable for an F.R.C.S. Final candidate. Salary £670 p.a., less £140 p.a. for board-residence. Further details on request.

Please apply, with 2 testimonials, to the Administrative Officer, as soon as possible.

HOUSE SURGEON (E.N.T.), Male or Female, vacant now. New department with high turnover and 4 Outpatient Clinics weekly. No casualty department. Recognised for F.R.C.S. and D.L.O.

HOUSE PHYSICIAN (Chest Unit), second or third post, Male or Female, vacant now. Duties include care of about 20 chest cases (including T.B. Chalets), which may increase in due course, and 4 outpatient clinics weekly, including refills, forming a progressive chest unit for the Aylesbury area. Instruction in bronchoscopy and bronchography given. An acute Geriatric Unit, a small long-stay Annexe, and a medical Outpatient Clinic provide some general medicine. No casualty department. Applications for a locum appointment will be considered.

Both posts are recognised for Pre-registration Service, but registered practitioners are invited to apply.

Applications, with 2 testimonials, to the Administrative Officer as soon as possible.

ABERYSTWYTH GENERAL HOSPITAL, Aberystwyth. (81 Beds.) MID WALES HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required to commence duties 1st November, 1953. Salary in accordance with the terms and conditions of service for hospital medical and dental staffs, with full residential emoluments.

Applications, together with 3 recent testimonials, to be addressed to—

J. PRICE THOMAS,
Secretary to the Management Committee.

The General Hospital, Aberystwyth.

ABERDEEN GENERAL HOSPITALS BOARD OF MANAGEMENT. Applications are invited for the appointment of a REGISTRAR in Ophthalmology at the Aberdeen Royal Infirmary to commence duty immediately. Conditions of service in accordance with the terms issued by the Department of Health for Scotland.

Applications, with the names of 2 referees, should be lodged with the Secretary, Aberdeen General Hospitals, 62, Queen's-road, Aberdeen, within 14 days of the appearance of this advertisement.

ASHFORD CHEST CLINIC, ASHFORD HOSPITAL, ASHFORD, MIDDLESEX. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. MEDICAL REGISTRAR (whole-time) required at above Clinic. This is a new chest clinic and there are 30 associated beds in the Hospital. Good training in general medicine essential and special experience in diseases of the chest desirable. Clinic may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, Staines Group Hospital Management Committee, Ashford Hospital, Ashford, Middlesex, by 13th October, 1953.

ASHFORD HOSPITAL, Ashford, Middlesex. Staines GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE SURGEON (Male) required at above Hospital for Traumatic and Orthopædic Unit. 6 months appointment, vacant 27th October. Preference given to pre-registration candidates.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital, as soon as possible.

ASHFORD HOSPITAL, Ashford, Middlesex. Staines GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE OFFICER (Male) required at above Hospital for Special Departments (E.N.T., pædiatric, ophthalmology, &c.). 6 months appointment, vacant 27th October.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital as soon as possible.

ASHFORD HOSPITAL, Ashford, Kent. Applications are invited for the appointment of RESIDENT HOUSE SURGEON (casualty and orthopædics) at the above Hospital. Salary £350, £400, or £450 a year according to experience. A deduction of £100 a year will be made in respect of residential emoluments.

Applications, stating age, qualifications, and the names and addresses of 2 referees, to the Group Secretary, " Ash-Eton," Radnor Park West, Folkestone.

ASHFORD (near), KENT. WILLESBOROUGH HOS-PITAL. Applications are invited for the appointment of HOUSE SURGEON at the above Hospital. Good experience in general surgery with some casualty work. Married quarters available. Salary £350, £400, or £450 a year, less £100 a year for residential emoluments.

Applications, stating age, qualifications, and the names and addresses of 2 referees, should be forwarded to the Group Secretary, " Ash-Eton," Radnor Park West, Folkestone.

BATH. ROYAL UNITED HOSPITAL. (404 Beds.) Applications are invited from medical practitioners for the post of HOUSE SURGEON (orthopædic and traumatic) at above Hospital, a modern general hospital with recently completed permanent twin operating-theatres. The post offers opportunity not only in traumatic surgery but in cold orthopædics and the specialised field of arthritic surgery. The post is recognised under the F.R.C.S. regulations and for pre-registration purposes.

Applications, stating age, qualifications and experience, with 3 testimonials, should be forwarded to—

J. LAWRENCE MEARS, Secretary,
Bath Hospital Management Committee.

Manor Hospital, Bath.

BATH. ROYAL UNITED HOSPITAL. Applications invited from medical practitioners for post of HOUSE SURGEON (gynæcology and obstetrics) at the above Hospital. Post recognised for pre-registration purposes.

Applications, stating age, qualifications, and experience, with 3 testimonials, to be forwarded to—

J. LAWRENCE MEARS, Secretary,
Bath Hospital Management Committee.

Manor Hospital, Bath.

BATH. ST. MARTIN'S HOSPITAL. Applications are invited from registered medical practitioners for the post of RESIDENT CASUALTY OFFICER (Senior House Officer grade) at above Hospital.

Applications, stating age, qualifications and experience, with 3 testimonials, should be forwarded to—

J. LAWRENCE MEARS, Secretary,
Bath Hospital Management Committee.

Manor Hospital, Bath.

BATH. ST. MARTIN'S HOSPITAL. (614 Beds.) Applica-tions are invited from medical practitioners for the post of HOUSE SURGEON (orthopædic and traumatic) at above Hospital. The post offers opportunity not only in traumatic surgery but in cold orthopædics and the specialised field of arthritic surgery. The Hospital is recognised under the F.R.C.S. regulations and for pre-registration purposes.

Applications, stating age, qualifications and experience, with 3 testimonials, should be forwarded to the undersigned as soon as possible.

J. LAWRENCE MEARS, Secretary,
Bath Hospital Management Committee.

Manor Hospital, Bath.

BATH. ST. MARTIN'S HOSPITAL. Applications are invited from medical practitioners for the post of HOUSE PHYSICIAN at above Hospital. The post is recognised for pre-registration purposes.

Applications, stating age, qualifications and experience, with 3 testimonials, to be forwarded to—

J. LAWRENCE MEARS, Secretary,
Bath Hospital Management Committee.

Manor Hospital, Bath.

BATH. ST. MARTIN'S HOSPITAL. Applications are invited from medical practitioners for the post of HOUSE SURGEON at above Hospital. The post is recognised for pre-registration purposes, and under the F.R.C.S. regulations.

Applications, stating age, qualifications and experience, with 3 recent testimonials, should be forwarded to—

J. LAWRENCE MEARS, Secretary,
Bath Hospital Management Committee.

Manor Hospital, Bath.

BEDFORD GENERAL HOSPITAL. (435 Beds.) Bedford GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE SURGEON required. The appointment offers exceptional opportunities for general experience in a busy Acute Surgical Unit.

Applications, stating age, nationality, qualifications, previous appointments, together with copies of 2 testimonials, should be forwarded to the Group Secretary, 3, Kimbolton-road, Bedford.

BISHOP'S STORTFORD AND DISTRICT HOSPITAL, Rye-street, BISHOP'S STORTFORD, HERTS. (67 Beds—medical, surgical, and maternity. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited from registered medical practitioners for a RESIDENT HOUSE OFFICER (first or second post held). Salary £350–£400 p.a., less £100 p.a. for residential emoluments. Appointment to commence as soon as possible.

Applications, stating age, nationality, qualifications and experience, with copies of recent testimonials or the names of referees, should be sent to the Hospital Secretary, Haymeads Hospital, Bishop's Stortford, Herts.

BISHOP'S STORTFORD, HERTS. HAYMEADS HOSPITAL. (400 occupied beds. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited from registered medical practitioners for a RESIDENT HOUSE OFFICER (surgical), first or second post held. Pre-registration post. Salary £350–£400 p.a., less £100 p.a. for residential emoluments. Appointment to commence 7th October, 1953, or as soon after as possible.

Applications, stating age, nationality, qualifications and experience, with copies of recent testimonials or the names of referees, to the Hospital Secretary.

BISHOP'S STORTFORD, HERTFORDSHIRE. HAYMEADS HOSPITAL. (400 occupied beds. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited from registered medical practitioners for the appointment of HOUSE OFFICER (medical), Male or Female, first, second, or third post held, with primary attachment to Paediatric Ward of 24 Beds, and other duties in connection with 8 skin-beds and Casualty Department. Salary £350–£450 p.a., less £100 p.a. for residential emoluments. Appointment to commence as soon as possible.

Applications, stating nationality, age, qualifications, and experience, with copies of recent testimonials or the names of referees, should be sent to the Hospital Secretary as soon as possible.

BARROW-IN-FURNESS. NORTH LONSDALE HOSPITAL. BARROW AND FURNESS HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for a post of HOUSE PHYSICIAN (recognised for pre-registration) at the North Lonsdale Hospital, Barrow-in-Furness, under supervision of Consultant Physician. National conditions and salary scale.

Applications to Group Secretary, 52, Paradise-street, Barrow-in-Furness.

BARRY ACCIDENT AND SURGICAL HOSPITAL. CARDIFF HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (but may be Senior House Officer if sufficient experience) required immediately at above Hospital. Staffed by whole-time Consultant Surgeon and Surgical Registrar. Excellent experience given in general surgery.

Form of application from Group Secretary, 44, Cathedral-road, Cardiff.

BEXHILL-ON-SEA. BEXHILL HOSPITAL. (62 Beds.) 2 HOUSE SURGEONS. Posts now vacant. (A small modern hospital on the South coast.) Considerable acute surgical work and busy Outpatient Department. Excellent all-round experience. National scale of salary.

Apply to Hospital Administrator.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(*a*) **Biddulph Grange Orthopædic Hospital, Stoke-on-Trent** (104 children's beds)

Whole-time REGISTRAR in Orthopædics. Extensive experience in long-stay cases available. Resident.

(*b*) **North Staffordshire Royal Infirmary, Stoke-on-Trent** (475 beds, 66 traumatic)

Whole-time REGISTRAR in Orthopædics. Duties also at Orthopædic Hospital (77 Beds). Resident or non-resident. Experience specialty essential; higher qualification an advantage.

(*c*) **Birmingham (Selly Oak) Group of hospitals**

Whole-time REGISTRAR in E.N.T. Surgery. Duties in E.N.T. Department, Selly Oak Hospital (1098 Beds, including 39 E.N.T.). Successful candidate will spend approximately half-time in otological clinics in large factories in connection with M.R.C. investigations. Non-resident. Experience specialty and higher qualification an advantage.

(*d*) **Kidderminster General Hospital**

Whole-time REGISTRAR in General Surgery. Experience specialty essential. Higher qualification an advantage. Resident. Accommodation for married man with no children.

(*e*) **Malvern Wells, St. Wulstan's Hospital** (258 Beds)

Whole-time REGISTRAR in Tuberculosis. Resident. Experience specialty essential.

Application forms from Secretary, 10, Augustus-road, Birmingham, 15, to be returned before 19th October, 1953.

BIRMINGHAM ACCIDENT HOSPITAL (215 Beds), Bath-row, BIRMINGHAM, 15. HOUSE SURGEONS (Male or Female). 1 post vacant 1st October, 3 posts vacant 1st November. Recognised for F.R.C.S. The appointments will be for a period of 6 months, of which 2 may be spent in the Burns Unit (Medical Research Council). The hospital is the largest traumatic unit in the country and treats 50,000 new patients each year. Posts are open to registered practitioners and pre-registration applicants and offer ample opportunity for practical experience in the management of all types of injury and teaching by the Consultant staff.

Applications, with copies of recent testimonials or names of 2 referees, to the Administrator.

BIRMINGHAM. THE SKIN HOSPITAL. Inpatient DEPARTMENT, George-road, EDGBASTON, BIRMINGHAM, 15. Required, SENIOR HOUSE OFFICER or HOUSE OFFICER, according to experience. Post vacant mid-October. Inpatient Department is modern and well equipped, providing facilities for study of skin diseases. Successful applicant will be required to assist Consultant at outpatient clinics.

Applications, with copies of 2 recent testimonials, to the Secretary, Hospital Management Committee, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. Applications are invited for the post of NON-RESIDENT REGISTRAR in Dermatology (Registrar grade) for duty in the above hospitals. Tenable for 1 year in the first instance. Candidates must be registered medical practitioners and should have held a resident hospital appointment in medicine or surgery. The possession of the M.R.C.P. will be an advantage.

Forms of application may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Edgbaston, Birmingham, 15, and should be returned to him not later than 24th October, 1953.

BOSTON. GENERAL HOSPITAL. Sheffield Regional HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (general surgery and E.N.T.) required with relief duties in the Casualty Department. Appointment for 1 year in the first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 12th October, 1953, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

BOLTON DISTRICT GENERAL HOSPITAL. (545 Beds.) BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE PHYSICIAN (second or third appointment) for the Department of Pædiatrics, vacant 20th October, tenable for 6 months. Hospital recognised for D.C.H.

RESIDENT HOUSE SURGEONS (2) for general surgical duties. Both vacant now, tenable for 6 months and recognised under the Pre-registration Service scheme.

Applications, stating age, nationality, qualifications and experience, and the names of 2 referees, should be sent immediately to H. P. TRAVIS, Group Secretary.

The Royal Infirmary, Bolton.

BOVEY TRACEY (near), SOUTH DEVON. HAWKMOOR CHEST HOSPITAL. (214 Beds with Thoracic Unit.) 2 SENIOR HOUSE OFFICERS required. 1 to serve jointly in the Surgical and Medical Departments and 1 for the Medical Wards. Resident single accommodation available.

Applications, stating age, qualifications and experience, with names of referees, to be sent to the Group Secretary, Exeter Special Hospital Management Committee, 26, Queen-street, Exeter, as soon as possible.

BOVEY TRACEY (near), SOUTH DEVON. THORACIC SURGICAL CENTRE FOR DEVON (including Plymouth Area). SENIOR HOUSE OFFICER required for this Centre situated at Hawkmoor Chest Hospital. Both non-tuberculous and tuberculous thoracic surgical work is undertaken. Valuable experience in chest diseases is offered and previous experience in this branch, although desirable, is not essential. Resident single accommodation available.

Applications, stating age, qualifications and experience, together with copies of testimonials, or names of referees, to be sent to the Group Secretary, Exeter Special Hospital Management Committee, 26, Queen-street, Exeter, as soon as possible.

BRADFORD. ROYAL EYE AND EAR HOSPITAL.

HOUSE SURGEON (E.N.T.), vacant now.

HOUSE SURGEON (ophthalmology), vacant now.

Hospital recognised for D.L.O., D.O.M.S., and F.R.C.S. Salary for each post £350–£450 p.a., less £100 p.a. residential emoluments.

Applications, stating age, nationality, qualifications and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRADFORD CHILDREN'S HOSPITAL. (102 Beds.) 2 HOUSE OFFICERS (Female), 1 vacant now, 1 vacant 1st November. Salary £350–£450 p.a., less £100 p.a. residential emoluments. Hospital recognised for D.C.H.

Applications, stating age, nationality, qualifications and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRADFORD. ST. LUKE'S HOSPITAL.

SENIOR ORTHOPÆDIC HOUSE SURGEON/CASUALTY OFFICER, vacant now. Salary £670 p.a., less £130 p.a. residential emoluments.

HOUSE SURGEON (general and plastic), vacant now.

HOUSE SURGEON (general and casualty), vacant now.

ORTHOPÆDIC HOUSE SURGEON/CASUALTY OFFICER, vacant now.

Salary for above 3 posts £350–£450 p.a., less £100 p.a. residential emoluments.

Applications, stating age, nationality, qualifications, and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRADFORD ROYAL INFIRMARY.

ORTHOPÆDIC HOUSE SURGEON/CASUALTY OFFICER, vacant now.

HOUSE OFFICER (anæsthetics), vacant now.

Salary for above posts £350–£450 p.a., less £100 p.a. residential emoluments.

Applications, stating age, nationality, qualifications, and experience, with copy testimonials, to Secretary.

BRAINTREE, ESSEX. BLACK NOTLEY HOSPITAL. (544 Beds.) Applications invited for post of HOUSE OFFICER (orthopædic surgery), first, second, or third post. Post tenable for 6 months and is recognised under F.R.C.S. regulations. Salary in accordance with the terms of service issued by the Ministry of Health, plus £50 p.a.

Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

BRAINTREE, ESSEX. BLACK NOTLEY HOSPITAL. (544 Beds.) Locum SENIOR HOUSE OFFICER required for Surgical Tuberculosis Unit, comprising chiefly orthopædic tuberculosis, genito-urinary tuberculosis, and other non-pulmonary and combined lesions. Salary in accordance with the terms of service issued by the Ministry of Health.

Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

BRAINTREE, ESSEX. BLACK NOTLEY HOSPITAL. (544 Beds.) Applications invited for post of SENIOR HOUSE OFFICER for Surgical Tuberculosis Unit, comprising chiefly orthopædic tuberculosis, genito-urinary tuberculosis, and other non-pulmonary and combined lesions. Post tenable for 1 year. Salary in accordance with the terms of service issued by the Ministry of Health.

Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

BRECHIN ANGUS. STRACATHRO HOSPITAL. (680 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (resident or non-resident) to the geriatric wards of the Stracathro and Brechin Hospitals. These comprise 144 Beds in which active treatment and rehabilitation are carried out on patients drawn from all parts of the County. The successful candidate will work under the Consultant Geriatrician.

Applications, stating age, qualifications and experience, and enclosing 2 recent testimonials or naming 2 referees, should be addressed to the Medical Superintendent, Stracathro Hospital, Brechin, within 14 days of the appearance of this advertisement.

BRISTOL. COSSHAM/FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. FRENCHAY HOSPITAL. HOUSE SURGEON required to work in Plastic and Jaw Surgery Unit.

Applications, with full particulars, should be sent to the Group Secretary, Frenchay Hospital, Bristol.

BRISTOL. COSSHAM MEMORIAL HOSPITAL. Applications are invited for appointment of SENIOR HOUSE OFFICER in General Surgery at Cossham Memorial Hospital, a general hospital of 89 Beds situated in East Bristol.

Applications, quoting age, experience, and names of 2 referees, to the Group Secretary, Frenchay Hospital, Bristol.

BRIGHTON, 7. ROYAL SUSSEX COUNTY HOSPITAL. (300 Beds.) CASUALTY HOUSE SURGEON (1 of 3), including duties with Orthopædic and Traumatic Unit. Pre-registration post and recognised for F.R.C.S. from 1954. Vacant early October.

Applications, giving details of age, experience, &c., together with names and addresses of 2 referees, to be sent to the Administrative Officer.

BRIGHTON GROUP HOSPITALS. 2 House Surgeons for duties in the E.N.T. Department (78 Beds). Vacant mid-October. Recognised for F.R.C.S. and D.L.O.

Applications, with details of experience, &c., and names and addresses of 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BURY GENERAL HOSPITAL. Bury and Rossendale HOSPITAL MANAGEMENT COMMITTEE. There is a vacancy for a SENIOR HOUSE OFFICER (anæsthetics), resident or non-resident, the post being recognised for the D.A.

Applications, together with the names of 2 referees, should be made to— H. WILKINSON, Group Secretary.

Bury General Hospital, Walmersley-road, Bury, Lancs.

CARSHALTON, SURREY. QUEEN MARY'S HOSPITAL FOR CHILDREN. Required, HOUSE SURGEON (resident) for 6 months, for general surgical duties and for duties in E.N.T. Department. Salary according to national scale.

Applications, stating age, qualifications, and experience, with copies of 3 recent testimonials, should be sent to the Secretary by 17th October.

CARMARTHEN. WEST WALES GENERAL HOSPITAL. (160 Beds.) (Recognised by the Royal College of Surgeons and for Pre-registration Service.) Applications are invited for the post of RESIDENT HOUSE OFFICER (surgical). Salary £350, £400, and £450 p.a. (plus grant of £50 p.a.), according to experience, less £100 p.a. for board-residence.

Applications, stating age, qualifications, experience, and nationality, with names and addresses of 3 referees, to the Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

CHEPSTOW, MON. MEMORIAL WARDS. (150 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER (tuberculosis) required shortly. A Senior Hospital Medical Officer is also resident and the Consultant visits regularly. Hospital situated conveniently on outskirts of town. Salary £700–£50–£1000, less £150 for board-residence.

Write quoting 2 referees, to T. A. JONES.
64, Cardiff-road, Newport, Mon.

CHELMSFORD AND ESSEX HOSPITAL. Applications are invited for the post of CASUALTY OFFICER (Senior House Officer), resident and tenable for 6 months. It offers excellent experience in the treatment of fractures and diagnosis of acute medical and surgical emergencies. Opportunity is given for the Casualty Officer to follow up his cases in the wards and to obtain operating experience in major theatre under the guidance of the Consultants or the Resident Surgical Officer. Off-duty time is generous and the post is one likely to suit both an Officer seeking a higher qualification in surgery or one intending General Practice. Salary £670 p.a., with £130 deduction for residential emoluments.

Apply Secretary, Chelmsford Group Hospital Management Committee, Chelmsford and Essex Hospital, London-road, Chelmsford, Essex.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botleys Park War Hospital). (443 Beds.) Required SENIOR HOUSE OFFICER ANÆSTHETIST. Appointment recognised for the D.A. and the F.F.A. R.C.S. Salary in accordance with terms and conditions of National Health Service.

Applications, together with names and addresses of referees, to be sent to the Physician-Superintendent, St. Peter's Hospital, as soon as possible.

CHESTER. BARROWMORE HOSPITAL, Great Barrow. Male SENIOR HOUSE OFFICER (medical). Post vacant immediately. Salary £670, less £120 p.a. for residence. The Hospital is modern in all respects and contains Regional Thoracic Surgical Unit. Applications from ex-patients considered.

Apply, sending 2 references or names of referees, to Secretary.

CHESTER. BARROWMORE HOSPITAL, Great Barrow. (205 Beds.) Applications are invited from suitably qualified medical practitioners for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER (Male). Salary being £700–£50–£1000 p.a., less £130 p.a. for residence. The Hospital is modern in all respects and contains Regional Thoracic Surgical Unit. Applications from ex-patients considered.

Apply, sending 2 references or names of referees, to Secretary.

CHESTER (near). MEADOWSLEA HOSPITAL. Wrexham, Powys and Mawddach Hospital Management Committee. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (resident). Salary £700–£1000 p.a., less recognised charge for services provided by Hospital. The appointed candidate will be a member of a Chest team covering a wide area in North Wales with excellent opportunities for experience in hospital and chest clinic practice. Applications from ex-patients will be welcomed. A flat is available for the successful candidate.

Applications, stating age, qualifications, experience, together with the names of 3 referees, to the Secretary, Wrexham, Powys and Mawddach Hospital Management Committee, Maelor General Hospital, Wrexham, within 14 days.

CAMBORNE. TEHIDY CHEST HOSPITAL. (190 Beds.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON for the new Thoracic Surgical Unit which will finally extend to approximately 40 Beds, in modern surgical block. Salary £350–£450, less £100 p.a. residential emoluments.

Apply to the Hospital Secretary, Tehidy Chest Hospital, Camborne.

CAERPHILLY DISTRICT HOSPITAL. 2 House Surgeons (pre-registration if suitable candidates available) required at Caerphilly District Hospital, 6 miles from Cardiff, 144 Beds for acute general surgery, orthopædics, E.N.T., ophthalmology, gynæcology; 26 Beds for general medicine; busy Outpatient, Casualty and Pathology Departments staffed by full-time and visiting Consultants. Married quarters available. Tenable 6 months. Salary £400, less agreed deductions for married quarters and emoluments at £100 p.a. for single residential emoluments.

Apply, with full particulars, to the Group Secretary, Hospital Management Committee, St. Martins-road, Caerphilly, near Cardiff.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (265 Beds.) GENERAL SURGICAL AND UROLOGICAL HOUSE SURGEON. The above post, which is recognised for the F.R.C.S. Diploma, is now vacant. National Health Service salary and conditions.

Applications, together with copies of 2 testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CARDIFF. ST. DAVID'S HOSPITAL. (656 Beds.) CARDIFF HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER in the Casualty Department to commence duty as soon as possible.

Application form from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF. ST. DAVID'S HOSPITAL. (656 Beds.) CARDIFF HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER required immediately, in acute medical wards, working under direction of Consultants.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF. THE UNITED CARDIFF HOSPITALS. The Board of Governors invites applications for the appointment of SENIOR HOUSE OFFICER in the Ophthalmic Department.

Application forms can be obtained from the Secretary, United Cardiff Hospitals, Cardiff Royal Infirmary.

CHESTERFIELD ROYAL HOSPITAL. Applications are invited for the post of RESIDENT CASUALTY OFFICER (pre-registration grade or Senior House Officer status if person appointed has sufficient experience) now vacant at above Hospital. Ministry of Health salary and conditions of service. There are 2 Junior and 1 Senior Casualty Officers in the Department. The post is recognised for training for the F.R.C.S. examination. Duties are primarily in the Casualty Department but by mutual arrangement 1 Casualty Officer performs duties in the Accident and Orthopædic Department, and thus opportunities occur for all 3 to gain experience in that department.

Apply, stating age, nationality, and qualifications, with copies of recent testimonials, to—

M. H. BOONE, Secretary,
Chesterfield Hospital Management Committee.

CHESTERFIELD ROYAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE PHYSICIAN (Senior House Officer). 36-Bedded Unit, with opportunities for gaining experience in acute general medicine, pædiatrics, diabetes, and dermatology. The appointment will be tenable for 1 year, and the salary payable is £670 p.a., less £155 p.a. if resident.

Apply Secretary, Chesterfield Hospital Management Committee, for further details.

CHESTERFIELD ROYAL HOSPITAL. House Surgeon (pre-registration post) required immediately in this busy General Hospital. National salary and conditions.

Apply M. H. BOONE, Secretary, Chesterfield Hospital Management Committee.

CHESTERFIELD HOSPITAL MANAGEMENT COMMITTEE. Whole-time NON-RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER required for Whittington Hall, Chesterfield (372 female mentally deficient patients), and Scarsdale Hospital, Chesterfield. Salary £700–£50–£1000 p.a.

Apply M. H. BOONE, Secretary, from whom further particulars may be obtained.

CROYDON GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications invited for appointment of REGISTRAR in Pathology in the Croydon Group Laboratories. Training in all branches of hospital pathology.

Application forms obtainable from Group Secretary, Hospital Management Committee, General Hospital, Croydon, returnable within 14 days.

COVENTRY AND WARWICKSHIRE HOSPITAL. (346 Beds.) SENIOR HOUSE OFFICER (fracture and orthopædic) required for Receiving-Room duties. Vacant 31st October. Recognised for F.R.C.S.

Applications to the Secretary, Group 20 Hospital Management Committee, Stoney Stanton-road, Coventry.

COVENTRY HOSPITALS. Resident Senior House OFFICER in Anæsthetics required, vacant now. Salary £670 p.a. Recognised for F.F.A.R.C.S. Excellent experience in all types of general anæsthetics. Duties at Coventry and Warwickshire Hospital and Gulson Hospital.

Applications to the Secretary, Group 20 Hospital Management Committee, Stoney Stanton-road, Coventry.

COVENTRY. GULSON HOSPITAL. Senior House OFFICER for Gynæcological and Obstetric Department, vacant 21st November. Recognised for D.Obst.R.C.O.G. and M.R.C.O.G.

Applications to Secretary, Group 20 Hospital Management Committee, Stoney Stanton-road, Coventry.

CUCKFIELD HOSPITAL, Cuckfield, Sussex. Mid-Sussex HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER for Medical and Postoperative Wards. National Health Service conditions of service. Salary £670 p.a., subject to residential charge of £150 p.a. The post is now vacant.

Applications, stating age, qualifications and experience, and giving the names of 2 referees, should be addressed to the Group Secretary, at the above address.

CHICHESTER, SUSSEX. GRAYLINGWELL HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of SENIOR REGISTRAR (whole-time) at the above Hospital. Applicants should have had wide psychiatric experience and possession of the D.P.M. or its equivalent is essential. The Hospital has an admission-rate of 1000 a year and there are 3 active outpatient clinics. There are Departments of Research, Neurology, Psychology and Social Service, and there is a modern Electro-encephalographic Unit. There is accommodation for a single Officer.

Application forms, for which a stamped addressed envelope should be supplied, may be obtained from the Group Secretary, Graylingwell Hospital, Chichester, and 5 copies should be returned to him duly completed, not later than 14 days after the appearance of this advertisement.

COLCHESTER. ESSEX COUNTY HOSPITAL. (189 Beds.) Applications invited for post of HOUSE OFFICER to Casualty and Radiotherapy Departments at above Hospital. First, second, or third post; tenable for 6 months. Post recognised for F.R.C.S. Salary in accordance with the terms of service issued by the Ministry of Health.

Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

COLCHESTER. ESSEX COUNTY HOSPITAL. (189 Beds.) Applications invited for post of HOUSE PHYSICIAN (first, second or third post). Tenable for period of 6 months from mid-November, 1953. Salary in accordance with the terms of service issued by the Ministry of Health.

Applications, with copies of 3 testimonials, should be forwarded to the Secretary, Colchester Group Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

DARLINGTON MEMORIAL HOSPITAL. Applications are invited from Male or Female practitioners with experience for the post of SURGICAL REGISTRAR (Senior House Officer) which is one of a surgical team of 2 Registrars and 1 House Officer responsible for surgical beds and casualty. The post is recognised for the F.R.C.S.(Eng.). Salary £670 p.a., deduction of £150 p.a. for full residential emoluments. The post is tenable for 12 months and is renewable annually.

Apply with references, stating age and experience, to—
G. W. BECKWITH, Group Secretary.

DARLINGTON MEMORIAL HOSPITAL. (210 Beds.) DARLINGTON DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON (resident), which post is recognised for the F.R.C.S. (Eng.). Salary in accordance with national scale.

Apply, giving age and references, to the undersigned forthwith. G. W. BECKWITH, Group Secretary.

DARTFORD HOSPITAL MANAGEMENT COMMITTEE.

SENIOR HOUSE OFFICER (anæsthetics) at Joyce Green Hospital, Dartford.

HOUSE SURGEON (orthopædics) at the Southern Hospital, Dartford.

HOUSE OFFICER (E.N.T. and ophthalmology) at the Southern Hospital, Dartford.

Applications, stating age, qualifications, experience, nationality, and the names of 2 persons to whom reference may be made, to be sent for House Officers to the Medical Superintendent of the hospital concerned, and for Senior House Officer to the Group Secretary, Dartford Hospital Management Committee, the Bow Arrow Hospital, Dartford.

DEAL. VICTORIA HOSPITAL. Applications are invited from medical practitioners for the post of RESIDENT MEDICAL OFFICER at the above Hospital. Appointment provides excellent experience for persons intending to enter general practice. There is a regular Consultant Visiting Staff for all branches of medicine and surgery. Salary £450 a year. A deduction of £100 a year will be made in respect of residential emoluments. Comfortable married quarters available.

Applications, stating age, qualifications, and the names and addresses of 2 referees, to the Group Secretary, " Ash-Eton," Radnor Park West, Folkestone.

DEAL. VICTORIA HOSPITAL. Resident Medical OFFICER (Senior House Officer). This post in a modern well-equipped General Practitioner Hospital of 58 Beds offers first-class experience for those intending to enter general practice. There is a regular Consultant Visiting Staff for all branches of medicine and surgery. Furnished flat and garage available. Suitable for single, or married man with a family. Salary £670 a year, less deduction for residential emoluments.

Applications, stating age, qualifications, and the names and addresses of 2 referees, to the Group Secretary, " Ash-Eton," Radnor Park West, Folkestone.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (Post recognised for D.A.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (anæsthetics) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 12th October, 1953, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

DERBY. DERBYSHIRE ROYAL INFIRMARY. Gynæco-LOGICAL HOUSE SURGEON (pre-registration) or SENIOR HOUSE OFFICER required 18th October, 1953.

Applications, stating full details, with copies of 2 recent testimonials, should be sent as soon as possible to the Secretary at the Infirmary.

DERBY. DERBYSHIRE CHILDREN'S HOSPITAL. (86 Beds.) SENIOR HOUSE OFFICER (pædiatrics), vacant 14th October, 1953.

Apply, giving 2 names for reference to the Secretary, Derby No. 1 Hospital Management Committee, Babington-lane, Derby.

DENBIGH (near). LLANGWYFAN HOSPITAL. Clwyd AND DEESIDE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male or Female) for appointment of 3 JUNIOR or SENIOR HOUSE OFFICERS at the above Hospital. The Hospital has a total complement of 400 Beds and provides for the treatment of all types of pulmonary and non-pulmonary tuberculosis and also contains a major Thoracic Surgical Unit.

Applications, stating full name, age, nationality professional qualifications, particulars of present and previous hospital appointments, to be addressed to the undersigned, together with the names of 2 referees, to reach him within 14 days from the date of publication of this advertisement.

WILLIAM ROBERTS, Group Secretary.

" Rhianfa," Russell-road, Rhyl, 22nd September, 1953.

DONCASTER ROYAL INFIRMARY. (Recognised under the regulations for the D.A.) DONCASTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners with the necessary experience for the appointment of RESIDENT ANÆSTHETIST in the grade of Senior House Officer. Salary at the rate of £670 p.a., from which a deduction of £130 p.a. will be made for board, residence, &c.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with copies of 3 testimonials, should be forwarded to—

ARTHUR JONES, Secretary to the Committee.
Doncaster Royal Infirmary.

DONCASTER ROYAL INFIRMARY. (Recognised under the regulations for the F.R.C.S.) DONCASTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of SECOND CASUALTY OFFICER (Senior House Officer) at above Infirmary. Salary £670 p.a., from which a deduction at the rate of £130 p.a. will be made for residential emoluments.

Applications, stating age, qualifications, and details of present and previous appointments with dates, and enclosing copies of 3 recent testimonials, should be forwarded to—

ARTHUR JONES, Secretary to the Committee.
Doncaster Royal Infirmary.

DONCASTER ROYAL INFIRMARY. (Recognised under the regulations for the Fellowship and D.L.O.) DONCASTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the whole-time post of SENIOR HOUSE OFFICER (E.N.T. Department) in accordance with the terms and conditions of service for hospital medical and dental staffs (England and Wales). Salary at the rate of £670 p.a., less £130 p.a. for board, residence, &c.

Applications, stating age, education, qualifications, and details of present and previous appointments with dates, together with copies of 3 testimonials, should be forwarded to—

ARTHUR JONES, Group Secretary.
Doncaster Royal Infirmary.

DONCASTER. WESTERN HOSPITAL. Doncaster HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of RESIDENT MEDICAL OFFICER in the grade of Junior Hospital Medical Officer.

Applications, stating age, qualifications, and experience, together with copies of 3 recent testimonials, should be forwarded to the Secretary to the Committee, Doncaster Royal Infirmary.

DOVERCOURT, ESSEX. HARWICH AND DISTRICT HOSPITAL. (30 Beds.) Applications invited for appointment of SENIOR HOUSE OFFICER (Resident Surgical Officer). Post tenable for 1 year. Salary in accordance with the terms of service issued by the Ministry of Health.

Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

DOVER. ROYAL VICTORIA HOSPITAL. Applications are invited for the post of HOUSE SURGEON at the above Hospital. The post is recognised by the Royal College of Surgeons. Salary £350, £400, or £450 a year according to experience. A deduction of £100 a year will be made for residential emoluments.

Applications, stating age, qualifications, and the names and addresses of 2 referees, to the Group Secretary, " Ash-Eton," Radnor Park West, Folkestone.

EAST CUMBERLAND HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following HOUSE OFFICER appointments which are now vacant :—

Cumberland Infirmary, Carlisle (340 Beds)

1—General Surgery.
1—Orthopædics.
1—" Specials "—(E.N.T. and Eyes).

Applications, with names of 2 referees, should be forwarded immediately to the Secretary, East Cumberland Hospital Management Committee, Cumberland Infirmary, Carlisle.

EPPING. ST. MARGARET'S HOSPITAL. (485 Beds, 78 general surgical beds.) Applications are invited for post of HOUSE SURGEON to fill an immediate vacany. Busy general hospital with easy access to London. Salary on national scale, less deduction for board, lodging, &c.

Applications, with copies of 2 testimonials, to reach Group Secretary, Epping Group Hospital Management Committee, St. Margaret's Hospital, Epping, Essex, by 10th October, 1953.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. RESIDENT SENIOR ANÆSTHETIC HOUSE OFFICER required at above Hospital. Candidates should have held resident appointments in general hospitals and have had special experience in administering anæsthetics. Salary £670 p.a. Deduction of £130 p.a. for board, lodging, &c. Appointment for 6 months in first instance. Post vacant 9th November, 1953.

Applications, together with the names of 2 referees, to Group Secretary, Edgware General Hospital, Edgware, Middlesex, by 17th October, 1953.

EDINBURGH NORTHERN GROUP OF HOSPITALS. HOUSE SURGEON required for Thoracic Unit, Eastern General Hospital, 6 months commencing 1st October, 1953. Salary £350–£450 p.a. according to experience, with deduction of £100 for board and lodging.

Applications to Medical Superintendent, Western General Hospital, Edinburgh, 4.

EDINBURGH NORTHERN GROUP OF HOSPITALS. 1 HOUSE PHYSICIAN required for Rheumatic Unit, Northern General Hospital, for 6 months commencing 1st October, 1953. Salary £350–£450 p.a. according to experience, with deduction of £100 for board and lodging.

Applications to Medical Superintendent, Western General Hospital, Edinburgh, 4.

GLASGOW, W.1. WESTERN INFIRMARY. There are immediate vacancies for 2 HOUSE OFFICERS (non-resident) in the Department of Radiology, at a salary of £450 p.a. The posts are suitable for candidates who intend to take the qualifying course for the D.M.R.(D.).

Applications, stating age, qualifications and experience, together with the names and addresses of 2 referees, to be sent to the Medical Superintendent.

GREENOCK. RAVENSCRAIG (MENTAL AND GENERAL) HOSPITAL. RENFREWSHIRE MENTAL HOSPITALS BOARD. Applications are invited for a whole-time appointment as SENIOR HOUSE OFFICER (medical) at above Hospital. Salary and conditions of service in accordance with National Health Service regulations.

Applications in writing should be sent to the Physician-Superintendent as soon as possible.

GREAT YARMOUTH AND GORLESTON GENERAL HOSPITAL, Dene Side, GREAT YARMOUTH. Vacancy on 1st November, 1953, for RESIDENT MEDICAL OFFICER (Senior House Officer status), Male or Female, for the Medical Unit of the Great Yarmouth and Gorleston Hospital. The Unit comprises 30 beds for acute medical cases, fully equipped to undertake all types of medical treatment and investigations, and it is under the personal direction of a Consultant Physician. The post provides an excellent opportunity for a practitioner reading for a higher medical qualification. Salary £670, less £150 for residence.

Applications, with names of 3 referees, should be sent to the Hospital Secretary, Dene Side, Great Yarmouth.

GRIMSBY GENERAL HOSPITAL. (220 Beds.) Grimsby HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (gynæcological), Male or Female, for duties at the above-named Hospital and Scartho Road Infirmary, Grimsby. The post is now vacant.

Applications, with names of 2 referees, to Hospital Secretary, Grimsby General Hospital.

GRIMSBY. SPRINGFIELD HOSPITAL (Chest and Infectious Diseases). (210 Beds.) GRIMSBY HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (medical). Salary in accordance with terms and conditions of service of hospital medical and dental staffs, £670 p.a. In case of married applicant, house available. All forms of tuberculosis are treated in this Hospital and modern methods of therapy are available, including major thoracic surgery.

Applications, with names of 3 referees, should be submitted to the Hospital Secretary, Springfield Hospital, Scartho, Grimsby.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (229 Beds.) RESIDENT HOUSE PHYSICIAN required. Post is tenable for 6 months from 1st November and is recognised for pre-registration candidates.

Applications, with copies of 3 testimonials, should be sent to the Hospital Secretary as soon as possible.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (229 Beds.) RESIDENT HOUSE SURGEON required. The post is in general surgery and is recognised for the F.R.C.S. examination, tenable for 6 months and approved for pre-registration practitioners. The vacancy will occur on 1st November.

Applications, with copies of 3 testimonials, should be sent to the Hospital Secretary.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. CASUALTY OFFICER required. The grading is that of Senior House Officer, and 2 Casualty Officers are employed who share the work of the department which is part of the Orthopædic and Traumatic Unit. Regular instruction is given in traumatic surgery, and Casualty Officers take part in the work of the fracture clinics. Post vacant now and will be resident for the first 6 months with option of renewal.

Applications, with copies of testimonials, to the Hospital Secretary.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) SENIOR HOUSE OFFICER (casualty and orthopædic), post vacant now. National scale of salary.

Apply to Hospital Administrator.

HASTINGS GROUP OF HOSPITALS. Locum Surgical OFFICER (non-resident) required immediately. Salary £16 weekly.

Apply Group Secretary, 11, Holmesdale-gardens, Hastings (phone 5400).

HASTINGS AND ST. LEONARDS. BUCHANAN HOS-PITAL. (94 Beds.) SENIOR HOUSE OFFICER required for urology and children's surgery. Post, vacant 20th November, is recognised for F.R.C.S., may be tenable for 6 or 12 months. National scale of salary.

Apply to Hospital Administrator.

HAVERFORDWEST. PEMBROKE COUNTY WAR MEMORIAL HOSPITAL. (151 Beds—Recognised by the Royal College of Surgeons and for Pre-registration Service.) Applications are invited for the post of RESIDENT HOUSE OFFICER (surgical). Salary £350, £400, or £450 p.a., plus grant of £50 p.a., according to experience, less £100 p.a. for residential emoluments.

Applications, stating age, qualifications, experience, and nationality, with names and addresses of 3 referees, to Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

HALIFAX. ROYAL HALIFAX INFIRMARY. (301 Beds.) SENIOR HOUSE OFFICER in General Surgery required. Post vacant late October. Salary £670 p.a., with deduction of £130 p.a. for residence, &c.

Applications to Group Secretary, Royal Halifax Infirmary, Halifax.

HARROGATE. ROYAL BATH HOSPITAL, Cornwall-road. (145 Beds. A National Hospital for the treatment of rheumatism and allied diseases, which is the centre of rheumatism research for the area.) HARROGATE AND RIPON HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER. The Hospital is recognised as having an authorised Physical Medicine Department and time spent in the above post will afford experience in physical medicine and will count towards the qualifying 12 months for the Diploma in Physical Medicine. Salary £670 p.a., subject to a deduction of £140 p.a. in respect of board and lodging. The appointment will be subject to the National Health Service superannuation regulations.

Applications to be forwarded to the Hospital Secretary, Royal Bath Hospital, Harrogate.

HEMEL HEMPSTEAD, HERTS. WEST HERTS HOS-PITAL. (170 Beds—5 residents.) HOUSE PHYSICIAN to Children's Department required (second or subsequent post). The appointment is recognised for the D.C.H.

Applications, giving details of experience and qualifications, and enclosing copies of 2 recent testimonials, should be sent to the Administrator.

HEMEL HEMPSTEAD, HERTS. WEST HERTS HOS-PITAL. (170 Beds—5 residents.) CASUALTY OFFICER (Junior Hospital Medical Officer). Salary £700–£50–£1000 p.a., less £130 p.a. for residential emoluments. Post vacant mid-October.

Applications, giving full details, together with copies of 2 recent testimonials, should be sent to the Hospital Secretary.

HESWALL, CHESHIRE. CLEAVER HOSPITAL. (220 Beds.) CENTRAL WIRRAL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER. Excellent facilities for obtaining good knowledge of modern treatment of pulmonary tuberculosis in all its branches including major surgery. Applicants should have had some experience in the treatment of pulmonary tuberculosis and held previous house appointment. Applications from ex-patient practitioners welcome. Salary £670 p.a., less £150 for emoluments. Terms and conditions of service for hospital medical and dental staffs (England and Wales) will apply.

Applications to be submitted to Physician-Superintendent immediately.

HESWALL, CHESHIRE. CLEAVER HOSPITAL. (220 Beds.) CENTRAL WIRRAL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER. The post offers good experience in modern treatment of tuberculosis. The Hospital deals with acute cases, and minor and major surgery is carried out by members of the Liverpool Chest Surgical Unit. Applicants should have had previous experience in the treatment of tuberculosis, and a knowledge of chest surgical procedure would be an advantage. Applications from ex-patient practitioners will be considered. Salary, terms, and conditions of service for hospital medical and dental staffs (England and Wales) will apply.

Applications, including names of 3 referees, should be addressed to the Physician-Superintendent as soon as possible.

HILLINGDON HOSPITAL (30 Beds) AND MOUNT PLEASANT HOSPITAL, SOUTHALL (79 Beds). HOUSE PHYSICIAN required for Tuberculosis Unit at above Hospitals. Post graded as Senior House Officer.

Applications, with copies of not more than 3 recent testimonials, to Medical Director, Hillingdon Hospital, Uxbridge, Middlesex, by 12th October.

HILLINGDON HOSPITAL, near Uxbridge, Middlesex. (General—705 Beds.) PÆDIATRIC REGISTRAR required at above Hospital. Previous pædiatric experience essential. Duties include experience in Children's Medical Ward, Neonatal Unit, and Pædiatric Outpatient Clinics. Unit recognised for D.C.H. Candidates may visit Hospital by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, Uxbridge Group Hospital Management Committee, The Furze, Field Heath-road, Hillingdon, Middlesex, by 12th October.

HOVE GENERAL HOSPITAL, Sackville-road, Hove, 3. HOUSE SURGEON AND CASUALTY OFFICER (recognised for F.R.C.S.). Post vacant immediately. Salary and conditions of service in accordance with national scale (£350–£450, less £100 p.a. for residential emoluments).

Applications, stating age, qualifications, experience, and naming 2 referees, to the Administrative Officer.

HEREFORD. COUNTY HOSPITAL. (333 Beds.) House OFFICER (general surgery) required.

Applications, with copies of 2 recent testimonials, to be sent to the Medical Superintendent, County Hospital, Hereford.

HORSHAM, SUSSEX. ROFFEY PARK REHABILITATION CENTRE. (120 Beds and a turnover of 800 cases a year.) Applications are invited for the whole-time appointment of JUNIOR HOSPITAL MEDICAL OFFICER at this Psychiatric Unit. The post offers excellent experience in the treatment and resettlement of the neuroses. There is substantial post-graduate teaching at the associated Institute. Every facility will be given for further study, both within the Centre and outside. A modern, unfurnished, labour-saving house is available at a rental of £42 p.a. There is also a staff day-nursery in the grounds. Applicants are welcome to visit the Centre by appointment with the Medical Director.

Apply to Secretary, Roffey Park Hospital Management Committee, Horsham, Sussex.

HOUNSLOW HOSPITAL, Staines-road, Hounslow, MIDDLESEX (General Acute—81 Beds) invite applications for appointment of RESIDENT HOUSE SURGEON; duties include Casualty Department. 6 months appointment. National Health Service salary and conditions of service.

Applications, stating qualifications, age, &c., with copies of up to 3 recent testimonials or names for reference, to the Hospital Secretary.

HOUNSLOW CHEST CLINIC, 28, Bell-road, Hounslow, MIDDLESEX. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR (whole-time), non-resident, required at above Clinic. Clinic has associated beds at Ashford Hospital, Middlesex. Good general medical experience essential and special experience in diseases of the chest desirable. Candidates may visit Clinic by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, Staines Group Hospital Management Committee, Ashford Hospital, Ashford, Middlesex, by 13th October, 1953.

HUDDERSFIELD ROYAL INFIRMARY. (312 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON to the Gynecological and Abnormal Maternity Department, required to commence duties on 1st November, 1953. The post is recognised for the D.Obst.R.C.O.G. and is a pre-registration appointment. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.
The Royal Infirmary, Huddersfield.

HULL ROYAL INFIRMARY. Locum Tenens Registrar in General Surgery at above Infirmary required until early November, 1953.

Applications, with full particulars, and the names of 2 referees to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, as soon as possible.

HULL ROYAL INFIRMARY. Hull A Group Hospital MANAGEMENT COMMITTEE. Applications are invited for the following posts :—

RESIDENT SURGICAL OFFICER (Senior House Officer grade). Recognised for F.R.C.S.
CASUALTY OFFICER (Senior House Officer grade).
E.N.T. HOUSE SURGEON (Senior House Officer grade). Recognised for F.R.C.S. and D.L.O.
2 HOUSE SURGEONS (recognised for F.R.C.S.).
2 HOUSE PHYSICIANS (1 recognised for M.D. (Lond.)).
ORTHOPÆDIC HOUSE SURGEON.

Forms of application from the Hospital Secretary, Hull Royal Infirmary.

HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. (Recognised for D.A.) SENIOR HOUSE OFFICER in Anæsthetics required for duties at various hospitals in the Group. Resident or non-resident. Salary £670 p.a.; if resident, less £130 for residential emoluments. The appointment will be for 12 months in the first instance, but will be terminable at any time by 2 months notice on either side.

Application forms may be obtained from and should be returned as soon as possible to R. J. CARLESS, Group Secretary. Hull Royal Infirmary.

HULL. KINGSTON GENERAL HOSPITAL. (447 Beds.) Applications are invited for the appointments of SURGICAL HOUSE OFFICER (mainly gynæcology) and HOUSE OFFICER (general surgery), recognised pre-registration appointments. Salary £350, £400, or £450, according to experience. The posts are resident and tenable for 6 months.

Applications to be forwarded to the Secretary, Hull A Group Hospital Management Committee.

HULL. KINGSTON GENERAL HOSPITAL. (447 Beds.) Applications are invited for the appointment of HOUSE PHYSICIAN (recognised pre-registration appointment). Salary £350, £400, or £450, according to experience. The post is resident and tenable for 6 months.

Applications to be forwarded to the Secretary, Hull A Group Hospital Management Committee.

HULL. KINGSTON GENERAL HOSPITAL. (447 Beds.) Applications are invited for the post of SENIOR HOUSE PHYSICIAN. There are 2 Junior House Physicians. Resident post, and vacant at the end of November. Salary £670 p.a., less £130 for emoluments.

Applications to be forwarded to the Secretary, Hull A Group Hospital Management Committee.

HULL. VICTORIA HOSPITAL FOR SICK CHILDREN, Park-street. (143 Beds.) HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for 2 HOUSE SURGEON posts. These posts are for a term of 6 months in each case and are now vacant. Both count towards D.C.H. qualification. Salary as per national terms of service.

Replies, with testimonials, to be sent to the Hospital Secretary.

HULL. VICTORIA HOSPITAL FOR SICK CHILDREN, Park-street. (143 Beds.) HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. Locum HOUSE SURGEONS required (2).

Applications to the Hospital Secretary, at the above address.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (360 Beds.) Applications are invited for the post of SENIOR HOUSE SURGEON to the Fracture and Orthopædic Department. The post is graded Senior House Officer and is now vacant. The Department has 2 Consultants, about 60 Beds, and a large outpatients attendance and offers a wide experience.

Applications, stating age, nationality, experience, and copies of 3 recent testimonials, to the Hospital Secretary.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (360 Beds.) Applications are invited for the post of HOUSE SURGEON to the General Consultant Surgeon. The post is recognised for the F.R.C.S. examinations.

Applications, with copies of recent testimonials, to the Hospital Secretary.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (360 Beds.) EAST ANGLIAN REGIONAL HOSPITAL BOARD. RADIOLOGICAL REGISTRAR at the above Hospital. The department is the centre for Consultant Radiological Services for the Ipswich Hospital Group. Appointment for 1 year, renewable for second year.

Applications, stating age, qualifications, and details of present and previous appointments, together with names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 12th October, 1953. Candidates invited to visit Hospital by direct arrangement with the Hospital Management Committee Secretary at the Hospital.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (360 Beds.) EAST ANGLIAN REGIONAL HOSPITAL BOARD. SENIOR MEDICAL REGISTRAR. Applicants should have had wide experience in general medicine and preference will be given to holders of a higher qualification. House available outside the Hospital. Appointment for 1 year in the first instance, subject to renewal thereafter on an annual basis.

Applications, stating age, qualifications, details of previous and present appointments, together with names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 12th October, 1953. Candidates invited to visit the Hospital by direct arrangement with Hospital Management Committee Secretary at the Hospital.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (360 Beds.) Applications are invited for the post of HOUSE SURGEON to the Fracture and Orthopædic Department. Approved pre-registration post.

Applications, stating age, nationality, experience, and copies of recent testimonials, to the Hospital Secretary.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. South WEST MIDDLESEX HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (preferably second or third post) required for Specials Unit, comprising Plastic, Ophthalmic and E.N.T. Departments.

Applications, stating age, nationality, qualifications with dates, and details of experience, together with copies of up to 3 recent testimonials, to Group Secretary, Management Committee, West Middlesex Hospital, Isleworth, Middlesex, by 8th October, 1953.

KENDAL. WESTMORLAND COUNTY HOSPITAL. (82 Beds.) RESIDENT SENIOR HOUSE OFFICER (surgical). The successful applicant will work with a Consultant Surgical Unit and attend at Consultative Clinics. The duties will involve a certain amount of work in the Orthopædic Department. The post is vacant now and normally tenable for 1 year.

Applications, with names of 2 referees, to be addressed to the Group Secretary, Royal Lancaster Infirmary, Lancaster.

KINGSTON HOSPITAL, Wolverton-avenue, Kingston UPON THAMES. KINGSTON GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from suitably qualified and experienced medical officers for the post of SENIOR HOUSE OFFICER (general surgery) which becomes vacant on 1st January, 1954. The post is recognised for the F.R.C.S. The appointment may be resident or on a duty room basis.

Applications, stating age, experience and qualifications, and accompanied by 2 recent testimonials or names of referees, should reach the Physician-Superintendent of the Hospital as soon as possible.

LEICESTER ISOLATION HOSPITAL AND CHEST UNIT, Groby-road, LEICESTER. (328 Beds.) Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER (medical). Salary £670 p.a., less £150 residential emoluments. The appointment is tenable for 6 months and may extend for a further 6 months. Experience will be gained in chest diseases, including tuberculosis, and also fevers.

Applications, giving age, nationality, and qualifications, &c., and copies of 2 recent testimonials, to be forwarded as soon as possible to the Physician-Superintendent at the above Hospital.

LEICESTER GENERAL HOSPITAL AND ROYAL INFIRMARY. (Recognised training hospital for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT REGISTRAR (orthopædics) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 12th October, 1953, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

LEICESTER (near). CARLTON HAYES HOSPITAL, NARBOROUGH, near LEICESTER. (Recognised for training for D.P.M.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time REGISTRAR (psychiatry) required. A house is available if required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 12th October, 1953, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

LYMINGTON HOSPITAL, Lymington, Hants. (107 Beds.) RESIDENT SENIOR HOUSE OFFICER (medical) required immediately.

Applications with copies of testimonials, to be submitted as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

LEEDS. UNITED LEEDS HOSPITALS. Applications are invited for the post of RESIDENT AURAL OFFICER at the General Infirmary, Leeds. The post, which is of Senior House Officer status, will be for a period of 1 year in the first instance.

Applications, stating age, sex, nationality, qualifications, and previous posts with dates, together with the names of 3 referees, to be forwarded to the undersigned not later than Wednesday, 7th October, 1953.

S. CLAYTON FRYERS, Secretary to the Board.
General Infirmary, Leeds, 1.

LEEDS REGIONAL HOSPITAL BOARD AREA. Medical ACT, 1950. RESIDENT HOUSE OFFICER posts. Recognised pre-registration house posts will be available for the 6 months commencing 1st November, 1953, in the following hospitals approved under the Medical Act, 1950. Preference will be given to pre-registration candidates, but applications will also be accepted from practitioners registered before 1st January, 1953.

Scarborough Hospital (191 Beds)
1 Surgical (general surgery, orthopædic and E.N.T.).
1 General Surgical.
County Hospital, York (222 Beds)
2 Surgical (general surgery and gynæcology)
1 Medical.
Hull Royal Infirmary and Sutton (242 Beds)
1 Surgical (general surgery and gynæcology).
1 Surgical (E.N.T.).
1 Surgical (ophthalmology).
1 Medical.
Kingston General Hospital, Hull (398 Beds)
1 Surgical (general surgery, gynæcology and orthopædic).
Victoria Children's Hospital, Hull (143 Beds)
1 General Surgical.
1 Surgical (general surgery and orthopædic).
Westwood Hospital, Beverley (202 Beds)
1 Surgical (orthopædic).
East Riding General, Driffield (249 Beds)
1 Medical.
Pontefract General Infirmary (89 Beds)
1 General Surgical.
Clayton Hospital, Wakefield (200 Beds)
1 Surgical (general surgery, orthopædic and gynæcology).
1 Medical (general medical, pædiatric and ophthalmology).
1 Mixed (general medical, general surgery and dermatology).
General Hospital, Wakefield (158 Beds)
1 Medical (general medical and pædiatric).
Pinderfields General, Wakefield (663 Beds)
1 General Surgical.
1 Surgical (orthopædic).
1 Medical.
1 Medical (neurology).
General Hospital, Batley (99 Beds)
1 Surgical (orthopædic and ophthalmology).
General Hospital, Dewsbury (119 Beds)
1 Medical (general medical, pædiatric and dermatology).
Staincliffe General, Dewsbury (314 Beds)
1 Surgical (general surgery, orthopædic and E.N.T.).
Huddersfield Royal Infirmary (304 Beds)
1 General Surgical.
1 Surgical (midwifery and gynæcology).
Royal Halifax Infirmary (301 Beds)
1 Surgical (ophthalmology and E.N.T.).
2 Medical.
Halifax General Hospital (425 Beds)
1 General Surgical.
1 Medical.
1 Midwifery.
Bradford Royal Infirmary (507 Beds)
1 Surgical (general surgery and urology).
1 Surgical (orthopædic and casualty).
1 Medical.
St. Luke's Hospital, Bradford (828 Beds)
1 General Surgical.
1 Medical.
Bradford Children's Hospital (101 Beds)
1 Medical (pædiatric).
Keighley Victoria Hospital (144 Beds)
1 Surgical (general surgery, gynæcology and E.N.T.).
1 Surgical (general surgery and orthopædic).
General Hospital, Otley (170 Beds)
1 Medical (general medical and pædiatric).
St. James's Hospital, Leeds (1539 Beds)
3 General Surgical.
1 Surgical (gynæcology).
7 Medical.
1 Medical (geriatrics).
1 Medical (pædiatric).
1 Medical (dermatology).
St. Mary's Hospital, Leeds (216 Beds)
1 Midwifery.

Candidates should express, where applicable, their preference for medical, surgical, or midwifery posts within the same hospital on the application form.

Candidates wishing to apply for posts at more than 1 hospital should complete a separate form in respect of each hospital.

Application forms can be obtained from the Senior Administrative Medical Officer, Leeds Regional Hospital Board, Park-parade, Harrogate, or from the Dean, The School of Medicine, Thoresby-place, Leeds, 2, and should be returned to either of the above-named as soon as possible. Application may be made in advance of results of final examinations.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the following REGISTRAR posts :—

Anæsthetics

(*a*) Hull A Group with additional duties at hospitals in the Hull B and East Riding Groups. (Non-resident.)

(*b*) York A and Tadcaster Group. (Non-resident.)

Orthopædic Surgery

(*a*) The General Hospital, Batley, and other hospitals in the Dewsbury, Batley and Mirfield Group. (Resident.)

(*b*) Hull A, Hull B, and East Riding Groups. (Non-resident.) This post will include some duties in the Casualty Department.

Applications, stating age, qualifications, and details of present and previous appointments, with dates, together with the names and addresses of 3 referees, should be forwarded to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 9th October, 1953.

LEEDS (near). SCALEBOR PARK HOSPITAL. Burley-IN-WHARFEDALE, near LEEDS. Applications are invited for the post of SENIOR HOUSE OFFICER (Male or Female) at Scalebor Park, a modern hospital of 323 Beds for the active treatment of nervous and mental disorders. The Hospital is associated for teaching purposes with the Department of Psychiatry of Leeds University and facilities will be granted for attending the D.P.M. course. The Salary is £670 p.a., less £130 for full residential emoluments.

Applications to the Medical Superintendent immediately.

LINCOLN. COUNTY HOSPITAL. (Recognised for training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (orthopædics) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 12th October, 1953, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

LINCOLN. COUNTY HOSPITAL. (200 Beds.) Lincoln NO. 1 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (surgery). The post is recognised for F.R.C.S. Terms and conditions of service in accordance with those published for hospital medical and dental staffs.

Applications, together with copies of 3 recent testimonials, should be forwarded to the undersigned as soon as possible.

R. W. HOWICK, Group Secretary.

LIVERPOOL, 9. WALTON HOSPITAL. (1321 Beds.) SENIOR HOUSE OFFICER in Department of Chest Diseases.
HOUSE SURGEONS (2) in acute general surgical wards.
HOUSE PHYSICIANS (3) in acute general medical wards.
The House Officer posts are recognised pre-registration appointments.

Applications, stating age, nationality, and experience, together with copies of 2 testimonials, to Physician-Superintendent.

LOUTH COUNTY INFIRMARY. (200 Beds.) Grimsby HOSPITALS MANAGEMENT COMMITTEE.
Locum SENIOR HOUSE OFFICER (medical).
Locum SENIOR HOUSE OFFICER (surgical).
Locum SENIOR HOUSE OFFICER (obstetrics and gynæcology).
Required immediately. Salary £13 per week, less £150 p.a. in respect of residential emoluments.

Applications, with names of 2 referees, to Hospital Secretary, County Infirmary, Louth, Lincs.

LOUTH, LINCS. COUNTY INFIRMARY. (200 Beds.) (Recognised training hospital for F.R.C.S.) Applications are invited for the resident post of SENIOR HOUSE OFFICER (surgical) now vacant. Salary £670 p.a., less £150 for residential emoluments.

Applications, giving full particulars, with names of 2 referees, should be addressed to the Hospital Secretary.

LOUTH, LINCS. COUNTY INFIRMARY. (200 Beds.) GRIMSBY HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (obstetrics, gynæcology, and some other duties) which will become vacant at this General Hospital in October. The national scale of salary applies and a deduction of £150 p.a. will be made for residential emoluments.

Applications, giving all details, together with the names of 2 referees, should be addressed to the Hospital Secretary.

LOUTH, LINCS. COUNTY INFIRMARY. (200 Beds.) GRIMSBY HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (medical), now vacant, at this General Hospital. The national scale of salary applies and a deduction of £150 p.a. will be made for residential emoluments.

Applications, giving all details, together with the names of 2 referees, should be addressed to the Hospital Secretary.

LOUTH, LINCS. COUNTY INFIRMARY. (200 Beds.) Applications are invited for the post of RESIDENT HOUSE SURGEON now vacant. The post is recognised for the F.R.C.S. examination and Pre-registration Service.

Applications, giving full details, together with the names of 2 referees, should be addressed to the Hospital Secretary.

MARKET DRAYTON (near), SALOP. CHESHIRE JOINT SANATORIUM. (305 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer or Senior House Officer, according to experience). Post offers exceptional experience in the treatment of pulmonary tuberculosis.

Applications to the Medical Superintendent at the Sanatorium.

MANSFIELD AND DISTRICT GENERAL HOSPITAL. SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SURGICAL REGISTRAR required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 12th October, 1953, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

MANSFIELD AND DISTRICT GENERAL HOSPITAL. (207 Beds.) MANSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in Anæsthetics (resident). The post is recognised for the D.A. Appointment will be for 1 year. Salary £670 p.a., with a deduction of £135 in respect of residential emoluments.

Applications, stating age, qualifications and experience, together with copies of 2 testimonials, should be forwarded to the undersigned immediately.

A. ASHWORTH, Group Secretary,
Mansfield Hospital Management Committee.
Oak Bank, Crow Hill-drive, Mansfield.

MANSFIELD AND DISTRICT GENERAL HOSPITAL. (207 Beds.) MANSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON (pre-registration or Senior House Officer post). Post recognised for F.R.C.S. examinations.

Applications, stating age and qualifications, together with copies of 2 recent testimonials, to be forwarded to Group Secretary, Mansfield Hospital Management Committee, Crow Hill-drive, Mansfield.

MANSFIELD. RANSOM SANATORIUM. Nottingham NO. 5 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER with effect from 1st November, 1953. The Sanatorium contains 185 Beds for the treatment of pulmonary tuberculosis in men, women, and children, including a modern Thoracic Surgery Unit. Salary £670 p.a., less £150 for full residential emoluments, which include a comfortable flat.

Applications, stating age, qualifications, and experience, and enclosing copies of 2 recent testimonials, to be sent to the Group Secretary, Harlow Wood Hospital, near Mansfield.

MANCHESTER VICTORIA MEMORIAL JEWISH HOSPITAL. (Non-sectarian. General Hospital—105 Beds.) NORTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident appointment of REGISTRAR (general surgery) at the above Hospital to act as Resident Surgical Officer. The post is recognised for the F.R.C.S.

Applications, stating age, nationality, present and previous appointments with dates, also the names and addresses of 2 referees, to be sent to the undersigned within 10 days of the appearance of this advertisement.

A. T. SAMPSON, Group Secretary.
Crumpsall Hospital, Manchester, 8.

MANCHESTER. NORTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of GROUP REGISTRAR (E.N.T.) for duties at Hospitals within the Group, but chiefly at Ancoats Hospital. The post is recognised for the D.L.O.

Applications, stating age, nationality, qualifications, and dates, particulars of previous appointments with dates, along with names and addresses of 2 referees, to be sent to the undersigned within 10 days of the appearance of this advertisement.

A. T. SAMPSON, Group Secretary.
Crumpsall Hospital, Manchester, 8.

MANCHESTER. NORTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident appointment of SENIOR HOUSE OFFICER (orthopædics), now vacant, with duties at Crumpsall Hospital and other hospitals within the Group.

Applications, stating age, nationality, qualifications and dates, present and previous appointments with dates, and the names and addresses of 2 referees, to be sent to the undersigned within 10 days of the appearance of this advertisement.

A. T. SAMPSON, Group Secretary.
Crumpsall Hospital, Manchester, 8.

MANCHESTER, 4. ANCOATS HOSPITAL. (General Hospital—152 Beds.) NORTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE OFFICER (surgery) with some E.N.T. surgery, now vacant.

Applications, stating age, nationality, details of qualifications and experience, both with dates, and names and addresses of 2 referees, to be sent to the undersigned within 10 days of the appearance of this advertisement.

A. T. SAMPSON, Group Secretary.
Crumpsall Hospital, Manchester, 8.

MANCHESTER, 4. ANCOATS HOSPITAL. (General Hospital—152 Beds.) NORTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident appointment of SENIOR HOUSE OFFICER (surgery), vacant on 1st November, 1953, to act as Assistant Resident Surgical Officer and for casualty duties in large Casualty Department. The Hospital is recognised for the purpose of the F.R.C.S.

Applications, stating age, qualifications and dates, present and previous appointments with dates, and the names and addresses of 2 referees, to be sent to the undersigned within 10 days of the appearance of this advertisement.

A. T. SAMPSON, Group Secretary.
Crumpsall Hospital, Manchester, 8.

MANCHESTER ROYAL EYE HOSPITAL. United Manchester Hospitals. Applications are invited for RESIDENT MEDICAL STAFF (Senior House Officer grading). Salary £670 p.a., less £130 p.a. for residential emoluments.

Application forms may be obtained from the undersigned.

H. R. NORTH, General Superintendent.

MANCHESTER, 8. CRUMPSALL HOSPITAL. (General Hospital—1225 Beds.) NORTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident appointment of SENIOR HOUSE OFFICER (medicine), now vacant.

Applications, stating age, nationality, qualifications and dates, present and previous appointments with dates, also the names and addresses of 2 referees, to be sent to the undersigned within 10 days of the appearance of this advertisement.

A. T. SAMPSON, Group Secretary.
Crumpsall Hospital, Manchester, 8.

MANCHESTER, 8. CRUMPSALL HOSPITAL. (General Hospital—1225 Beds.) NORTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident appointment of SENIOR HOUSE OFFICER in the Genito-urinary Department with some general surgical work in another unit. The post is recognised for the F.R.C.S.

Applications, stating age, nationality, qualifications and dates, present and previous appointments with dates, and the names and addresses of 2 referees, to be sent to the undersigned within 10 days of the appearance of this advertisement.

A. T. SAMPSON, Group Secretary.
Crumpsall Hospital, Manchester, 8.

MANCHESTER. BAGULEY HOSPITAL, Wythenshawe. (Tuberculosis and Chest Surgery—402 Beds.) SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER (medical) at the above Hospital. The appointment offers the opportunity to gain a wide experience in the diagnosis of chest diseases and of the treatment, both medical and surgical, of respiratory tuberculosis.

Applications, stating age, nationality, qualifications, experience, and the names of 2 referees, to be forwarded to the undersigned within 7 days of the appearance of this advertisement.

A. H. KEATES, Secretary to the Committee.
Withington Hospital, Manchester, 20.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. PARK HOSPITAL, DAVYHULME. (General Hospital—426 Beds.)

1 SENIOR HOUSE OFFICER (general surgery). Post now vacant.

1 SENIOR HOUSE OFFICER (non-tuberculous thoracic surgery) for Manchester Regional Hospital Board Centre. Post vacant mid-October, 1953.

1 HOUSE OFFICER (E.N.T. surgery). (Pre-registration.) Post now vacant.

General surgery posts recognised for F.R.C.S. examination.

Forms from Secretary.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS. Applications are invited from provisionally registered medical practitioners for 2 posts of HOUSE OFFICER in Obstetrics. Salary in accordance with national scale. The appointments are for 6 months from 1st January, 1954.

Application forms may be obtained from the undersigned and returned not later than 17th October, 1953.

A. R. WISE, General Superintendent.
Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of Whole-time REGISTRAR in Diagnostic Radiology to the West Manchester Hospital Management Committee. Primarily for duty at Park Hospital, Davyhulme, but with duties at other Group Hospitals. Resident or non-resident, post vacant 31st December, 1953. 12 months appointment subject to renewal.

Forms from Secretary, Park Hospital, Davyhulme.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the non-resident post of SENIOR REGISTRAR in Psychiatry. The person appointed will be required to attend Consultant Psychiatric Clinics and take part in the treatment of inpatients and outpatients at hospitals in Bolton and Bury in association with the Consultant Psychiatrist. D.P.M. essential.

Forms of application may be obtained from the Senior Administrative Medical Officer, Manchester Regional Hospital Board, Cheetwood-road, Manchester, 8, and should be returned, with names of 3 referees, by 12th October, 1953.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of RESIDENT REGISTRAR in the Board's Non-tuberculous Thoracic Surgery Unit of 48 Beds at Park Hospital, Davyhulme. 1-year appointment, renewable. Post now vacant.

Application forms from the Secretary, West Manchester Hospital Management Committee, Park Hospital, Davyhulme, Urmston.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR in Orthopædics, which is joint between the Rochdale and District and Bury and Rossendale Hospital Management Committees. This post is recognised under the F.R.C.S. regulations.

Applications, together with the names of 2 referees, should be made to the Group Secretary, Bury General Hospital, Bury, Lancs.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited for a post of REGISTRAR (resident or non-resident) in General Medicine to the Barrow and Furness Group of hospitals, with main duties at North Lonsdale Hospital and Devonshire Road Infectious Diseases Hospital.

Applications to Group Secretary, Barrow and Furness Hospital Management Committee, 52, Paradise-street, Barrow-in-Furness, not later than 15th October, 1953.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of NON-RESIDENT REGISTRAR in Chest Diseases. The main duties will be with the Stockport and Buxton Hospital Management Committee, and the successful candidate will work under the direction of the Consultant Chest Physician. The post offers scope for experience in both tuberculous and non-tuberculous diseases of the chest and in hospital, sanatorium, and clinic practice.

Applications, stating age, qualifications, and experience, together with copies of 2 testimonials, to be addressed to the undersigned, forthwith. H. G. PRICE, Group Secretary.

59B, Shaw-heath, Stockport, Cheshire.

MANCHESTER REGIONAL HOSPITAL BOARD. Bury AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. REGISTRAR in Anæsthetics (resident or non-resident). Recognised for the D.A. regulations.

Apply, giving names of 2 referees, to the Group Secretary, Bury General Hospital, Bury, Lancs.

MANCHESTER REGIONAL HOSPITAL BOARD and the BOARD OF GOVERNORS OF THE UNITED MANCHESTER HOSPITALS invite applications for the post of SENIOR REGISTRAR in Diagnostic Radiology. The person appointed will be required to undertake duties at the Christie Hospital and Holt Radium Institute, Manchester, and at the United Manchester Hospitals (Manchester Royal Infirmary, &c.). D.M.R.D. essential.

Forms of application may be obtained from the Senior Administrative Medical Officer, Manchester Regional Hospital Board, Cheetwood-road, Manchester, 8, and should be returned, with the names of 3 referees, to be received by 20th October, 1953.

MITCHAM JUNCTION, SURREY. WANDLE VALLEY HOSPITAL. ST. HELIER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER (medical), vacant now. The Hospital contains 140 Beds for infectious diseases and geriatric cases.

Applications, stating age, qualifications and experience, with copies of 2 testimonials and the name of 1 referee, should be sent immediately to the Group Secretary, St. Helier Hospital, Carshalton, Surrey.

MAIDSTONE. PRESTON HALL HOSPITAL, British LEGION VILLAGE, MAIDSTONE, KENT. Applications are invited for the appointment of SENIOR HOUSE OFFICER. Salary £670 p.a., national scale and conditions. The sanatorium contains 330 Beds for the treatment of tuberculosis and the duties of the post will consist of acting as House Surgeon to the Thoracic Surgical Unit.

Applications, stating age, qualifications, and names of 2 referees, to be sent by not later than 31st October, 1953, to—

A. A. HOWICK, Secretary to the Management Committee.

MAIDSTONE (near). LENHAM SANATORIUM. (172 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER at Lenham Sanatorium, near Maidstone. The Sanatorium has 172 Beds for the treatment of pulmonary tuberculosis. Salary £670 a year, with a deduction of £150 a year for residential emoluments. Appointment for 12 months.

Applications to Physician-Superintendent, Lenham Sanatorium, near Maidstone.

MAIDSTONE. KENT COUNTY OPHTHALMIC AND AURAL HOSPITAL. (113 Beds.) MID KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE SURGEON in the E.N.T. Department of the above hospital. There are 55 E.N.T. Beds and 6 specialist operating sessions each week. Valuable experience is available and the post is recognised for the purposes of the F.R.C.S. and the D.L.O. Salary will be £670 a year less £150 a year for residential emoluments.

Applications immediately to the Administrative Office, Kent County Ophthalmic and Aural Hospital, Maidstone, Kent.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (135 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE SURGEON. Post recognisable for the F.R.C.S.(Eng.). Salary £670 a year, with deduction of £150 a year for residential emoluments.

Applications to the Administrative Officer at the Hospital as soon as possible.

MAIDSTONE. OAKWOOD HOSPITAL. Senior House OFFICER required immediately for the above Mental Hospital of 2200 Beds. Salary £670 p.a. Full residential accommodation is available for single male officers on payment of charge of £150 p.a. The Hospital which carries out all forms of treatment is conveniently situated enabling medical officers to attend D.P.M. and other courses in London. Outpatient clinics are held at local general hospitals.

Applications in writing, giving details and experience, and the names of 2 persons to whom reference can be made, to be sent to the Medical Superintendent.

NORTH GLOUCESTERSHIRE CLINICAL AREA. The BOARD OF GOVERNORS OF THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited by the above Boards from registered medical practitioners for the joint appointment of REGISTRAR in General Surgery. Candidates should have had previous experience in general surgery. The appointment will be held for 1 year in the first instance, and be renewable for a further year. During the first year, the successful candidate will work mainly at the Gloucestershire Royal Hospital, Gloucester, but may be required to undertake sessions in other hospitals in the Area as circumstances require.

Applications, stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 10th October, 1953.

NORTHAMPTON GENERAL HOSPITAL. (485 Beds.) Applications invited for following posts, vacant 1st October, 1953 :—

Department of Anæsthetics, HOUSE OFFICER. Recognised for D.A. and for pre-registration.

General Surgery, HOUSE OFFICER. Recognised for F.R.C.S. and for pre-registration.

Fracture and Orthopædic Department, HOUSE OFFICER. Recognised for F.R.C.S. and for pre-registration.

All 6-month appointments in first instance. Deduction £100 a year residential emoluments.

Applications, enclosing copies of 3 testimonials, as soon as possible to S. G. HILL, Superintendent.

NOTTINGHAM. CITY HOSPITAL. (823 Beds.) Applications are invited for the post of HOUSE SURGEON, vacant immediately. Recognised for pre-registration purposes.

Applications, stating age, nationality, qualifications, and experience, together with copies of not more than 3 testimonials, to be sent immediately to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners for the post of ORTHOPÆDIC AND FRACTURE SENIOR HOUSE OFFICER. The post offers exceptional experience in traumatic and orthopædic surgery. Duties to commence as soon as possible. Salary and conditions of service in accordance with Ministry regulations. If resident £150 deducted for emoluments.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to—

HENRY M. STANLEY, Secretary.

NOTTINGHAM. MAPPERLEY HOSPITAL. (Recognised for training for D.P.M.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT REGISTRAR (psychiatry) required. Appointment for 1 year in the first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 12th October, 1953, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

NEWARK GENERAL HOSPITAL. Nottingham No. 1 HOSPITAL MANAGEMENT COMMITTEE. Whole-time RESIDENT MEDICAL OFFICER with general duties required at Senior House Officer rate of salary. This post offers excellent experience to anyone preparing to enter general practice. The Hospital has a busy Outpatient Department. Appointment for 1 year in first instance.

Apply to Secretary, General Hospital, Nottingham, giving age, nationality, qualifications and present and previous appointments and names of 3 referees.

NEWARK GENERAL HOSPITAL, Newark. Sheffield REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SURGICAL OFFICER with general duties required at Registrar rate of pay. This post offers good experience to anyone preparing to enter General Practice. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 12th October, 1953, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

NEWPORT, I.W. ST. MARY'S HOSPITAL. (365 Beds.) ISLE OF WIGHT GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in Surgery. Salary £670 p.a. Applications are invited from registered medical practitioners.

HOUSE SURGEON. Post approved for Pre-registration Service. National salary scale and conditions. Vacant now.

Applications, stating age, nationality, qualifications, and experience, together with the names of 2 referees, to be sent as soon as possible to Group Secretary, Hospital Management Committee Headquarters, Clatterford House, Carisbrooke, I.W.

NEWPORT, I.W. ST. MARY'S HOSPITAL. (365 Beds.) ISLE OF WIGHT GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN. Post approved for Pre-registration Service. National salary scale and conditions. Vacant 1st December, 1953.

Applications, stating age, nationality, qualifications and experience, together with the names of 2 referees, to be sent to the Group Secretary, Hospital Management Committee Headquarters, Clatterford House, Carisbrooke, I.W., as soon as possible.

NEWPORT, MON. ROYAL GWENT HOSPITAL. (259 Beds.) (Recognised for D.A. and F.F.A.R.C.S.) Applications are invited for the post of SENIOR HOUSE OFFICER in Anæsthesia (non-resident). The successful candidate will receive a thorough training in the specialty and previous experience is not essential. Post based at this Hospital, but will attend neighbouring hospital as well with Consultants. Extensive experience in anæsthesia available.

Write, quoting 2 referees, to T. A. JONES,
64, Cardiff-road, Newport, Mon.

NEWTON ABBOT HOSPITAL. (General Section—65 Beds.) RESIDENT HOUSE SURGEON (Male or Female) required for 1st October, 1953. Married quarters available.

Applications, stating qualifications, nationality, age, with copy testimonials, to be sent to the Group Secretary, Torquay District Hospital Management Committee, 62/64, East-street, Newton Abbot, S. Devon.

NEWCASTLE REGIONAL HOSPITAL BOARD. New-CASTLE HOSPITAL MANAGEMENT COMMITTEE. SENIOR REGISTRAR ANÆSTHETIST, whole-time at Newcastle General Hospital (861 Beds, including 310 surgical beds), and allied hospitals. Appointment up to 31st August, 1954, in the first instance and may be renewed for a further period. Salary £1000–£1300 p.a.

Applications, together with names and addresses of referees (preferably), or testimonials, to a total of 3, to be sent to the Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Win-TERTON HOSPITAL, SEDGEFIELD. REGISTRAR PSYCHIATRIST (whole-time) resident. Salary £775–£890 p.a. Appointment up to 31st August, 1954, in the first instance and may be renewed for a further period. Arrangements can be made for the person appointed to take the necessary course of study for the University of Durham Diploma in Psychological Medicine.

Applications, together with names and addresses of referees (preferably), or testimonials, to a total of 3, to be sent to the Regional Psychiatrist, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Durham HOSPITAL MANAGEMENT COMMITTEE. SURGICAL REGISTRAR (whole-time), resident or non-resident, at Dryburn Hospital (319 Beds). Salary £775–£890 p.a. Appointment up to 31st August, 1954, in the first instance, and may be renewed for a further year.

Applications, together with names and addresses of referees (preferably), or testimonials to a total of 3, to be sent to the Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. St. GEORGE'S HOSPITAL, MORPETH. REGISTRAR PSYCHIATRIST (whole-time), resident. Salary £775–£890 p.a. Appointment up to 31st August, 1954, in the first instance and may be renewed for a further period. Arrangements can be made for the person appointed to take the necessary course of study for the University of Durham Diploma in Psychological Medicine.

Applications, together with names and addresses of referees (preferably), or testimonials, to a total of 3, to be sent to the Regional Psychiatrist, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Sunderland HOSPITAL MANAGEMENT COMMITTEE. SENIOR REGISTRAR PHYSICIAN (whole-time) for the Geriatric Service in the above Group. Salary in accordance with national terms and conditions. Appointment for 1 year only.

Applications, together with names and addresses of referees (preferably), or testimonials, to a total of 3, to be sent to the Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 14 days.

NEWCASTLE GENERAL HOSPITAL. (861 Beds.) NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (Chest Unit). The above resident post becomes vacant on 1st November, 1953, and is tenable for 1 year.

Applications should be addressed to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, 4, together with 1 copy of 2 recent testimonials, by 17th October, 1953.

NEWCASTLE GENERAL HOSPITAL. (861 Beds.) Applications are invited for the resident post of SENIOR HOUSE OFFICER (Orthopædic Department), which is now vacant. The appointment is tenable for 12 months in the first instance.

Applications should be addressed to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, 4, together with 1 copy of 2 recent testimonials, by 17th October, 1953.

NUNEATON. GEORGE ELIOT HOSPITAL. (289 Beds.) SENIOR HOUSE OFFICER or HOUSE OFFICER (general medicine) required (50 acute beds). Pre-registration candidates may apply.

Applications to the Hospital Secretary.

NUNEATON. MANOR HOSPITAL. (139 Beds.) House SURGEON required for general surgical duties including E.N.T. and ophthalmic work. Recognised for F.R.C.S. and pre-registration.

Applications to the Hospital Secretary.

NUNEATON. MANOR HOSPITAL. (139 Beds.) House PHYSICIAN (32 general medical beds), vacant now. Pre-registration post.

Applications to the Hospital Secretary.

OLDHAM ROYAL INFIRMARY. (190 Beds.) Recognised for F.R.C.S. and D.L.O. HOUSE OFFICER (E.N.T. and ophthalmology).

Applications, with full particulars, to be forwarded to the Group Secretary, Oldham and District Hospital Management Committee, Central Offices, Rochdale-road, Oldham. Please quote Ref. No. B/154.

PLYMOUTH CLINICAL AREA. The Board of Governors OF THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited by the above Boards from registered medical practitioners for the joint appointment of REGISTRAR in General Surgery. Applicants should have had previous experience in general surgery. The appointment will be held for 1 year in the first instance, and be renewable for a further year. During the first year, the successful candidate will work mainly at the South Devon and East Cornwall Hospital, Plymouth, but may be required to undertake duties in other hospitals in the Area as circumstances require.

Applications, stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol 8, not later than 19th October, 1953.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL. Applications are invited from registered medical practitioners for the appointments of :—

(1) SENIOR HOUSE OFFICER in Surgery, Devonport Section, recognised for the Fellowship of the Royal College of Surgeons, vacant 8th December, 1953.

(2) HOUSE SURGEON, Devonport Section, vacant 1st December, 1953.

(3) SENIOR HOUSE OFFICER to Casualty and Traumatic Department, vacant immediately, Freedom Fields Section.

(4) PÆDIATRIC HOUSE PHYSICIAN, Freedom Fields Section, vacant 1st January, 1954, recognised for the D.C.H.

(5) HOUSE PHYSICIAN, Freedom Fields Section, vacant 1st January, 1954.

(6) HOUSE SURGEON, Freedom Fields Section, vacant 1st January, 1954, recognised for the Fellowship of the Royal College of Surgeons.

(7) SENIOR HOUSE OFFICER to Casualty and Fracture Department, Greenbank Road Section, vacant immediately.

(8) HOUSE PHYSICIANS (2 posts), Greenbank Road Section, both vacant 1st January, 1954.

(9) HOUSE SURGEON, Greenbank Road Section, vacant October, 1953, recognised for the Fellowship of the Royal College of Surgeons.

(10) RESIDENT ANÆSTHETIST, Greenbank Road Section, vacant immediately, recognised for the D.A.

Applications, stating age, nationality, qualifications and experience, with the names of 3 referees, to be sent to the undersigned as soon as possible.

ARTHUR R. CASH, Group Secretary.

7, Nelson-gardens, Stoke, Plymouth.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL, Greenbank Road. Applications invited from registered dental practitioners for the appointment of RESIDENT DENTAL HOUSE SURGEON, vacant 21st November, 1953. This appointment is recognised by the Royal College of Surgeons as fulfilling the requirements of candidates for the Fellowship of Dental Surgery.

Applications, stating age, nationality, and experience, together with copies of 3 recent testimonials, should be sent to—

ARTHUR R. CASH, Group Secretary.

7, Nelson-gardens, Stoke, Plymouth.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. INFECTIOUS DISEASES HOSPITAL. (310 Beds.) Applications are invited for the appointment of SENIOR HOUSE OFFICER, whose work will comprise duties in both infectious diseases and tuberculosis wards.

Applications, stating age, experience, and qualifications, and names of 2 referees, should be submitted as soon as possible to—

35, Grove-road South, Southsea. E. H. HURST.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post, vacant on 22nd December, 1953, of ANÆSTHETIC REGISTRAR in the Portsmouth Group, main duties at the Royal Portsmouth Hospital. 5 Consultant Anæsthetists practise in the Group.

Forms of application may be obtained from the Secretary, Portsmouth Group Hospital Management Committee, 35, Grove-road South, Southsea, which should be returned to him duly completed on or before 16th October, 1953. Canvassing will disqualify. Candidates may visit the above Hospital by arrangement with the Secretary of the Group.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of SURGICAL REGISTRAR at Saint Mary's Hospital, Portsmouth (150 acute surgical beds), vacant now. The post will include duties in the Department of Thoracic Surgery (18 Beds). The successful candidate must hold the F.R.C.S. degree.

Forms of application may be obtained from the Secretary, Portsmouth Group Hospital Management Committee, 35, Grove-road South, Southsea, which should be returned to him, duly completed, on or before 16th October, 1953. Canvassing will disqualify. Candidates may visit the above Hospital by arrangement with the Group Secretary.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following appointment :—

Queen Alexandra Hospital (with 126 surgical beds) SENIOR HOUSE SURGEON.

Applications, stating age, experience and qualifications, and names of 2 referees, should be submitted as soon as possible to—

35, Grove-road South, Southsea. E. H. HURST.

POOLE GENERAL HOSPITAL. Bournemouth and EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. RESIDENT ANÆSTHETIST (Senior House Officer) required 1st October, 1953. Hospital recognised for the D.A. and F.F.A.R.C.S.

Applications to the Hospital Secretary.

POOLE GENERAL HOSPITAL, Poole, Dorset. Bourne-MOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. 2 HOUSE SURGEONS (pre-registration) required. Posts vacant on 7th November, 1953, and 14th December, 1953, respectively. The Hospital is recognised for the F.R.C.S. and F.R.C.S.E.

Applications to the Hospital Secretary.

PONTYPOOL AND DISTRICT HOSPITAL, Pontypool, MON. (115 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER (surgical). This is the senior resident post. 2 House Surgeons and a House Physician also resident. Salary £700–£50–£1000, less £150 board-residence.

Write, quoting 2 referees, to T. A. Jones.

64, Cardiff-road, Newport, Mon.

PENZANCE. WEST CORNWALL HOSPITAL. (100 general beds.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from pre-registration graduates or qualified medical practitioners for the post of HOUSE SURGEON.

Applications, stating age, nationality, qualifications, and experience, and enclosing copies of 2 recent testimonials, should be forwarded to the Hospital Secretary, West Cornwall Hospital, Penzance.

PENZANCE. WEST CORNWALL HOSPITAL. (100 Beds —3 Residents.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (surgical) required. Post vacant now. Good and varied experience in diagnosis, treatment and operative procedure.

Applications, stating age, experience and nationality, to the Hospital Secretary, West Cornwall Hospital, Penzance.

READING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (Area Accident and Orthopædic Department). Duties (which include casualty work) at Royal Berkshire Hospital (403 Beds) and Battle Hospital (343 Beds). Person appointed will work with Registrar and House Officer.

Applications, stating age, nationality, present post, qualifications with dates, together with names of 2 referees, to the Group Secretary, 3, Craven-road, Reading.

READING. ROYAL BERKSHIRE HOSPITAL. (403 Beds.) Applications are invited for the appointment, House Officer grade, of RESIDENT ASSISTANT PATHOLOGIST, vacant 16th October, for period 6 months. Previous experience in pathology unnecessary.

Applications, with full particulars, and copies of recent testimonials to Secretary.

RUGBY. HOSPITAL OF ST. CROSS. House Physician required 21st October for acute Medical Unit (36 adult beds) and Children's Ward (10 pædiatric beds).

Applications, with copy testimonials, to Hospital Secretary.

REDRUTH. CAMBORNE-REDRUTH HOSPITAL, West CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from pre-registration graduates or qualified medical practitioners for an appointment of HOUSE SURGEON to the Obstetric and Gynæcological Departments, commencing on 1st January, 1954. This Hospital is recognised for the M.R.C.O.G. in Obstetrics.

Applications, stating age, experience, qualifications, and nationality, together with copies of 3 testimonials, should be submitted to the Hospital Secretary, Camborne-Redruth Hospital, Redruth, by 17th October.

REDRUTH. CAMBORNE-REDRUTH HOSPITAL. (151 Beds—4 Residents.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (surgical) required for the above Hospital. Post now vacant. This is a general hospital with a great variety of cases. The post gives good experience in diagnosis, operative and postoperative treatment, and in actual operative procedure to the candidate.

Applications, stating age, experience and nationality, together with references, to Hospital Secretary, Camborne-Redruth Hospital, Redruth, Cornwall.

REDHILL. EAST SURREY HOSPITAL, Shrewsbury-road. (139 Beds.) REDHILL GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN (Male) required. Post recognised for pre-registration service.

Apply to Hospital Secretary.

REDHILL COUNTY HOSPITAL, Earlswood Common, REDHILL, SURREY. (576 Beds.) REDHILL GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER (anæsthetics). To commence duty 1st November. Appointment recognised for D.A. Salary £670 p.a., less £130 for residence, &c.

Apply to Group Secretary at above address.

REDHILL COUNTY HOSPITAL, Earlswood Common, REDHILL, SURREY. (576 Beds.) REDHILL GROUP HOSPITAL MANAGEMENT COMMITTEE. CASUALTY OFFICER (Senior House Officer). Newly created post, vacant October, tenable for 12 months.

Apply to Group Secretary at above address.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER in Pathology in this large General Hospital containing well-equipped laboratory where excellent opportunities exist for gaining extensive experience.

Applications, stating age, nationality, qualifications with dates, and experience, together with copies of 2 recent testimonials or names of referees, should be sent immediately to the Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. Applications are invited from registered medical practitioners for the post, now vacant, of SENIOR HOUSE OFFICER (resident) for duties in the Casualty and Admissions Department at the above Hospital. This is a large general hospital, with specialised departments dealing with all types of acute medical and surgical cases. The post affords good opportunity for gaining tuition and experience.

Applications should be addressed immediately to the Secretary of the Romford Group Hospital Management Committee, Oldchurch Hospital, Romford, stating age, nationality, qualifications, experience, and 2 testimonials of recent date or names of 2 referees.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER in the Department of Ophthalmology.

Applications, stating age, qualifications, present appointment and experience with dates, together with copies of 2 testimonials of recent date or names of 2 referees, should be sent immediately to the Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROTHERHAM. MOORGATE GENERAL HOSPITAL. SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SURGICAL REGISTRAR required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 12th October, 1953, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

ROTHERHAM (near). WATHWOOD HOSPITAL. (104 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR in Thoracic Surgery (tuberculosis only) required for a new Unit which is being opened at the above Sanatorium. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 12th October, 1953, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SWANSEA HOSPITAL. (403 Beds.) Glantawe Hospital MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of Locum RESIDENT ANÆSTHETIST (Junior Hospital Medical Officer grade).

Applications, stating age, qualifications, and experience, should be addressed to the Group Secretary, Glantawe Hospital Management Committee, St. Helen's-road, Swansea.

O. C. HOWELLS, Group Secretary.

SWANSEA. MORRISTON HOSPITAL. (450 Beds.) GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the resident appointment of SENIOR HOUSE OFFICER in the Traumatic and Orthopædic Surgical Department.

Applications, stating age, qualifications and experience, should be addressed to the Medical Superintendent, Morriston Hospital, Swansea. O. C. HOWELLS, Group Secretary.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT CASUALTY OFFICER (Senior House Officer) for a period of 12 months from 16th December.

Applications, naming 2 referees, to Group Secretary, Odstock Hospital, Salisbury.

SCUNTHORPE AND DISTRICT WAR MEMORIAL HOSPITAL. (Recognised training hospital for D.A.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT REGISTRAR (anæsthetics) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 12th October, 1953, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SCUNTHORPE AND DISTRICT WAR MEMORIAL HOSPITAL. SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT REGISTRAR (orthopædics, general surgery, gynæcology) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 12th October, 1953, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SCOTLAND. SOUTH-EASTERN REGIONAL HOS-PITAL BOARD. Applications are invited for the post of REGISTRAR in Radiodiagnosis in the Edinburgh Northern Group of hospitals. The post is superannuable and the conditions of service are in accordance with the regulations.

Applications, giving particulars of age, qualifications and experience, together with the names of 2 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, within 30 days.

SCOTLAND. BOARDS OF MANAGEMENT FOR ANGUS, AND STRACATHRO AND BRECHIN HOSPITALS. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER to the Angus Tuberculosis Hospitals and Clinics, under the control of the Area Chest Physician, with duties at Stracathro, Noranside and Whitehills Hospitals, as required. Clinic domiciliary and laboratory experience will also be afforded. Salary scale £700–£50 (6)–£1000 p.a. Unmarried accommodation can be provided in Stracathro Hospital, but the Officer appointed may live out, if desired.

Applications, naming 3 referees, should be addressed to the Medical Superintendent, Arbroath Infirmary, Angus, to reach him within a fortnight of the appearance of this notice.

SLOUGH. UPTON HOSPITAL. Locum Anæsthetic REGISTRAR required 2nd October.

Applications, together with details of experience, should be addressed to the Hospital Secretary.

SHEFFIELD. CITY GENERAL HOSPITAL. (Recognised for Final Fellowship examination.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (thoracic surgery/general surgery) required. Large general hospital with Regional Department of Cardiology. Thoracic Surgical Unit deals with tuberculous and non-tuberculous cases. Previous surgical experience desirable. Appointment for 1 year in first instance in thoracic surgery and, if extended, second year will be spent in general surgery.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 12th October, 1953, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time Locum SENIOR SURGICAL REGISTRAR required at the Leicester Royal Infirmary for approximately 2 months from 15th November, 1953. Remuneration at the rate of £22 per week.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR REGISTRARS in Psychiatry required for Bracebridge Heath Hospital, near Lincoln, The Pastures Hospital, Mickleover, near Derby, and The Towers at Bracebridge Heath Hospital and the Towers Hospital; accommodation for single or married person available at the Pastures Hospital. Appointments for 1 year in the first instance reviewable annually. Opportunity for research and experience in those special branches of psychiatry available in the Hospital area.

Application forms and details of posts obtainable from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 12th October, 1953.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR SURGICAL REGISTRAR required for Leicester Royal Infirmary. Possession of higher surgical qualification desirable. Appointment for 1 year in first instance, reviewable annually. It has been agreed between Sheffield Regional Hospital Board and the Board of Governors of the United Sheffield Hospitals that the tenure of appointment will be divided between the Leicester Royal Infirmary and the Teaching Hospitals.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, together with names and addresses of 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10, to arrive not later than 12th October, 1953.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT SENIOR REGISTRAR in Chest Diseases required for the Nottingham Chest Service. Duties include sessions at the Nottingham and District Chest Centre, Basford Sanatorium, the Thoracic Surgical Unit at Nottingham City Hospital, and Nottingham No. 2 Mass Radiography Unit. Appointment for 1 year in the first instance, reviewable annually.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, and naming 3 referees, to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 19th October, 1953.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT SENIOR REGISTRAR in Radiology required. The successful candidate will be appointed primarily to the City General Hospital, Sheffield, but will, by agreement with the Board of Governors of the United Sheffield Hospitals, take part in a scheme whereby he and the Senior Registrars in Radiology at the Teaching Hospitals exchange duties for varying periods. The duties will also involve sessions at the Barnsley Hospitals. The appointment is for 1 year in the first instance, reviewable annually.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, together with names and addresses of 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10, to arrive not later than 19th October, 1953.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. ROYAL HOSPITAL UNIT. Applications are invited for the non-resident post of SENIOR REGISTRAR in General Medicine at the above Hospital. The appointment is for 1 year in the first instance and will be reviewed annually. It has been agreed in principle between the Board of Governors of The United Sheffield Hospitals and the Sheffield Regional Hospital Board that the appointment if extended to the full period of 4 years will be divided, if circumstances permit, between the Royal Hospital and a hospital in the Region.

Applications, stating age, qualifications, and experience, with the names of 3 referees, should be sent not later than 17th October, 1953, to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

SHREWSBURY. ROYAL SALOP INFIRMARY. (241 Beds.) SHREWSBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from general registered practitioners (Male or Female) for the appointment of RESIDENT HOUSE SURGEON in General Surgery. Vacant immediately, and tenable in the first instance for 6 months. Recognised for the F.R.C.S., and approved for Pre-registration Service. Salary and conditions of service in accordance with national scale.

Applications with references, should be sent to—

J. P. MALLETT, Group Secretary,
Group 15 Hospital Management Committee.

Royal Salop Infirmary, Shrewsbury, 27th July, 1953.

SHREWSBURY. ROYAL SALOP INFIRMARY. (241 Beds.) SHREWSBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of ORTHOPÆDIC/ACCIDENT HOUSE SURGEON (Senior House Officer). The successful applicant will be allowed to attend for 2 days a month at The Robert Jones and Agnes Hunt Orthopædic Hospital, Oswestry, for postgraduate study with the Consultant. The post is recognised under the revised Fellowship regulations in respect of the 6 months training required of candidates for the Final Fellowship examination.

Applications, stating age, qualifications, nationality and experience, accompanied by copy testimonials, should be sent to—

J. P. MALLETT, Group Secretary,
Group 15 Hospital Management Committee.

Royal Salop Infirmary, Shrewsbury, 10th July, 1953.

SHREWSBURY. ROYAL SALOP INFIRMARY. SHREWSBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male or Female) for the post of SENIOR HOUSE OFFICER or HOUSE OFFICER (pædiatric), to take charge of the Royal Salop Infirmary Children's Unit (70 Beds), under the Consultant Pædiatrician. Vacant 12th October, 1953. The Unit consists of medical, surgical, and fever beds.

Applications, stating age, qualifications, nationality and experience, accompanied by copy testimonials, should be sent to the Group Secretary, Shrewsbury Hospital Management Committee, Royal Salop Infirmary, Shrewsbury.

22nd August, 1953. J. P. MALLETT, Group Secretary.

SHREWSBURY. ROYAL SALOP INFIRMARY AND COPTHORNE HOSPITAL. (500 Beds.) SHREWSBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer grade). Post recognised under the conditions of the F.F.A.R.C.S. examination, and vacant 1st October, 1953.

Applications, stating age, nationality, qualifications, and previous experience, together with copies of recent testimonials, should be sent to the Group Secretary, Hospital Management Committee, Royal Salop Infirmary, Shrewsbury.

J. P. MALLETT, Group Secretary.

Royal Salop Infirmary, Shrewsbury, 12th September, 1953.

SHREWSBURY. EYE, EAR AND THROAT HOSPITAL. SHREWSBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (E.N.T.) vacant immediately. Duties at E.N.T. Hospital (68 Beds) and Copthorne Hospital (168 Beds). Post recognised for the D.L.O. R.C.S.

Applications, stating age, qualifications, nationality, and experience, together with copies of recent testimonials, should be sent to J. P. MALLETT, Group Secretary.

Royal Salop Infirmary, Shrewsbury, 24th September, 1953.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE OFFICER (medical), pre-registration post.

Applications, giving full details, together with copy testimonials, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (orthopædics) required, vacant now. Post recognised for F.R.C.S.

Applications, stating age and nationality, together with details of previous service, to the Group Secretary, Stoke-on-Trent Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE OFFICER (gynæcology and obstetrics), pre-registration post.

Applications, giving full details, together with copy testimonials, to the Group Secretary, Hospital Management Committee, Princess-road, Stoke-on-Trent.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Pre-registration appointments. HOUSE OFFICER (obstetrics and gynæcology) required. 2 posts vacant shortly. Recognised for M.R.C.O.G. and D.Obst.R.C.O.G.

Detailed applications, with copy testimonials, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent, as soon as possible.

SOUTHEND-ON-SEA HOSPITAL. Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER (clinical pathology) for duties within the units comprising the above Hospital. Post tenable for 1 year and recognised for the Diploma in Pathology. Previous experience in pathology not essential but applicants must have good clinical experience. Salary £670 p.a., less appropriate deduction for board.

Applications, with copies of at least 2 recent testimonials, should be sent to the undersigned as soon as possible.

J. C. FIELD, Secretary.

SOUTHPORT PROMENADE HOSPITAL. Senior House OFFICER (Surgeon), resident, mainly orthopædic and E.N.T. duties. Post vacant now. Post tenable for 12 months in first instance at £670 p.a., less £130 for emoluments.

Apply, stating age, nationality, qualifications, and experience, together with copies of 2 recent testimonials, to—

T. CROOK, Secretary,
Southport and District Hospital Management Committee.
Promenade Hospital, Southport.

SOUTHPORT GENERAL INFIRMARY. Senior House OFFICER in Anæsthetics (resident) required 5th November. Hospital recognised for D.A. Post tenable for 12 months in first instance at £670 p.a., less £130 for emoluments.

Applications, stating age, nationality, qualifications, and experience, together with copies of 2 recent testimonials, to be forwarded by 17th October, to—

T. CROOK, Secretary,
Southport and District Hospital Management Committee.
Promenade Hospital, Southport.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of Whole-time REGISTRAR in Anæsthetics at the above Hospital. Candidates may visit the Hospital if they so desire.

Forms of application, obtainable from the undersigned, should be returned not later than 17th October, 1953.

FRANK JENNINGS, Secretary,
Southampton Group Hospital Management Committee.
Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of Whole-time RADIOLOGICAL (Diagnostic) REGISTRAR at the above Hospital. Previous experience essential. The appointment entails duties at other hospitals in the Group. Candidates may visit the Hospital if they so desire.

Forms of application, obtainable from the undersigned, should be returned not later than 17th October, 1953.

FRANK JENNINGS, Secretary,
Southampton Group Hospital Management Committee.
Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) ORTHOPÆDIC HOUSE SURGEON required. Post tenable 6 months. This Hospital is the centre to which all trauma from a large industrial town and port is directed, thus providing excellent experience in the treatment of traumatic conditions; patients with orthopædic conditions are also drawn from a wide area.

Applications, with copies of testimonials, should be sent as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

ST. ALBANS CITY HOSPITAL. (382 Beds.) Post recognised for D.A. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time ANÆSTHETIC REGISTRAR required at the above Hospital, which may be visited by direct appointment.

Application forms obtainable from and returnable to, the Group Secretary, St. Albans City Hospital, Normandy-road, St. Albans, Herts, by 9th October, 1953.

ST. ALBANS, HERTS. CELL BARNES HOSPITAL. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR required at above Hospital. This is a modern hospital where 733 mental defectives of all types and ages are under care. Approved for D.P.M. Hospital may be visited by direct appointment. For a married man there is an attractive furnished flat and accommodation for single person.

Application forms obtainable from, and returnable to, Group Secretary, Hospital Management Committee, Harperbury Hospital, St. Albans, Herts, by 13th October, 1953.

STOCKPORT INFIRMARY, Stockport. (163 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (Non-resident Casualty Officer). Hours of duty: 8.30 A.M.–4.30 P.M., Monday to Friday; 8.30 A.M.–12 NOON Saturday. The post is suitable for a candidate wishing to read for a higher qualification.

Applications, stating age, qualifications and experience, together with copies of 2 testimonials, or the names of 2 referees, to be forwarded to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport, Cheshire.

STOCKPORT AND BUXTON HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the non-resident post of SENIOR HOUSE OFFICER (orthopædics) to the above Group.

Applications, stating age, experience, and qualifications, together with copies of 2 testimonials, to be addressed to the undersigned, immediately. H. G. PRICE, Secretary.

59B, Shaw-heath, Stockport, Cheshire.

STAFFORD HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics), Male or Female. Recognised for D.A. Post now vacant. Duties mainly at the General Infirmary, Stafford, which is the main and acute general hospital of the Group.

Applications, with copies of 3 testimonials, to the Group Secretary, Stafford Hospital Management Committee, 13, Foregate-street, Stafford.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE SURGEON required for post vacant 22nd November. Preference given to persons seeking pre-registration post under Medical Act, 1950.

Applications, stating age, qualifications, with dates, &c., together with copies of 2 testimonials, to Hospital Secretary by 16th October.

TRURO. ROYAL CORNWALL INFIRMARY. (212 Beds. 9 Residents.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the combined pre-registration post of HOUSE SURGEON (E.N.T. and Ophthalmic Departments) and JUNIOR HOUSE PHYSICIAN, vacant 4th November, 1953.

Applications, stating age, qualifications and experience, with copies of 2 recent testimonials, to the Hospital Secretary.

TRURO. ROYAL CORNWALL INFIRMARY. (General Hospital—212 Beds. 9 Residents.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the 2 posts of SENIOR RESIDENT HOUSE OFFICER to the Orthopædic and Traumatic Department. This is a large and busy centralised unit with 2 Consultants, 64 Beds, and Out-patient Departments also 45-Bed Rehabilitation Annexe which deal with the whole of the West Cornwall Area. The posts are now vacant, and are tenable for 1 year.

Applications, stating age, nationality, qualifications and experience, and accompanied by copies of 2 recent testimonials, should be forwarded to the Hospital Secretary, Royal Cornwall Infirmary, Truro, without delay.

TRURO. ROYAL CORNWALL INFIRMARY. (212 Beds. 9 Residents.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the newly created office of SENIOR HOUSE OFFICER (Pathological Department).

Applications, stating age qualifications, and experience, and enclosing copies of 2 recent testimonials, should be sent to the Hospital Secretary, Royal Cornwall Infirmary, Truro.

TUNSTALL. BURSLEM, HAYWOOD AND TUNSTALL WAR MEMORIAL HOSPITAL. (96 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for HOUSE OFFICER (medical).

Apply, with copy testimonials and details of previous appointments held, to the Group Secretary, Stoke-on-Trent Hospital Management Committee, Princes-road, Stoke-on-Trent, as soon as possible.

WOLVERHAMPTON HOSPITAL MANAGEMENT COMMITTEE GROUP NO. 16 BIRMINGHAM REGION.

The Royal Hospital, Wolverhampton (an Associated Hospital of the University of Birmingham Medical School)
SENIOR HOUSE OFFICER or HOUSE OFFICER (Fracture and Orthopædic Department), vacant now.
HOUSE OFFICER (Casualty Department), vacant now.
HOUSE OFFICER (Ear, Throat and Nose Department), vacant shortly.

Wolverhampton and Midland Counties Eye Infirmary
HOUSE OFFICER, vacant now. Appointment recognised for F.R.C.S. and D.O. examinations.

Applications, with copies of 3 recent testimonials, to be sent to W. COCKBURN, Group Secretary.
The Royal Hospital, Wolverhampton.

WORTHING HOSPITAL, Lyndhurst-road, Worthing, SUSSEX. (221 Beds.) WORTHING GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of SURGICAL HOUSE OFFICER (Senior House Officer grade). The post is recognised for the revised Fellowship regulations in respect of the 6 months training required by candidates for the Final Fellowship examination.

Applications, stating age, qualifications, nationality, and experience, together with copies of 2 recent testimonials, to be forwarded to the Hospital Secretary, as soon as possible.
A. V. OAKTON, Group Secretary.

WORKINGTON INFIRMARY, Cumberland. (86 Beds, plus Annexe 34 Beds, pre-registration post, recognised F.R.C.S. (Ed.).) HOUSE SURGEON (first, second, or Senior House Officer post), vacant now.

Detailed applications, with dates and copies of 2 testimonials, to Secretary.

WREXHAM. MAELOR GENERAL HOSPITAL. (513 Beds.) WREXHAM, POWYS AND MAWDDACH HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON at the above Hospital to commence immediately. The appointment is recognised for the Diploma of F.R.C.S. (Eng. and Edin.). Salary will be at the rate of £350, £400, or £450 p.a. according to experience, less £100 p.a. for full residential emoluments.

Applications, stating age, nationality, qualifications and experience, together with copies of 2 recent testimonials, should be addressed to—

WILLIAM JONES, Secretary, Wrexham,
Powys and Mawddach Hospital Management Committee.
Maelor General Hospital, Croesnewydd-road, Wrexham.

WREXHAM. WAR MEMORIAL HOSPITAL. (170 Beds.) WREXHAM, POWYS AND MAWDDACH HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON at the above Hospital, to commence immediately. The appointment is recognised for the Diploma of F.R.C.S. (Eng. and Edin.) and is an approved pre-registration House Officer post. Salary will be at the rate of £350, £400, or £450 p.a., according to experience, less £100 p.a. for residential emoluments.

Applications, stating age, nationality, qualifications and experience, together with copies of 2 recent testimonials, should be addressed to—

WILLIAM JONES, Secretary, Wrexham,
Powys and Mawddach Hospital Management Committee.
Maelor General Hospital, Croesnewydd-road, Wrexham.

WARRINGTON GENERAL HOSPITAL. (368 Beds.) Applications are invited for the post of HOUSE SURGEON (Male or Female) at the above Hospital. National Health Service terms and conditions. The staffing of the Surgical Unit consists of a Senior Registrar, Senior House Officer, and 2 House Surgeons. The post offers a comprehensive training in surgery.

Apply, giving full particulars, to—
H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington, Lancs.

WARRINGTON INFIRMARY. (172 Beds.) Applications are invited for a vacancy at the above Hospital for a RESIDENT HOUSE SURGEON (Male or Female). Salary will be £350–£450 p.a., less a deduction of £100 for full residential emoluments.

Applications should be sent to—
H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington, Lancs.

WARRINGTON INFIRMARY. (172 Beds.) Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (Resident Casualty Officer). The commencing salary is in accordance with the scale £700–£50–£1000, less a deduction of £130 for residential emoluments.

Applications, stating age, experience, and qualifications, should be sent to—
H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington, Lancs.

WARWICK (near). CENTRAL MENTAL HOSPITAL. SENIOR HOUSE OFFICER required in this Mental Hospital of 1400 Beds with Neurosis Unit, 4 adult and 2 child psychiatric clinics recognised for the D.P.M., and Departments of Electro-encephalography, Occupational Therapy, Psychology, and social work. Salary £670 p.a. A modern house is available. Rental (inclusive of rates), £95 0s. 6d. p.a.

Applications, together with the names and addresses of 3 referees, to the Medical Superintendent within 14 days of the appearance of this advertisement.

WARWICK HOSPITAL. Applications are invited for the resident post of HOUSE OFFICER in Orthopædics. Work includes attendance at clinics.

Applications, with copies of 2 recent testimonials, to the Administrative Officer, Warwick Hospital, Lakin-road, Warwick.

WARWICKSHIRE. SOUTH WARWICKSHIRE HOSPITAL GROUP (NO. 14). Applications are invited for the appointment of SENIOR HOUSE OFFICER (anæsthetics) for duties mainly at the Warwick Hospital. The post is now vacant.

Applications, giving the names and addresses of 3 referees, should be sent to the undersigned as soon as possible.
W. A. JAMES, Group Secretary.

87, Radford-road, Leamington Spa.

WARWICKSHIRE. SOUTH WARWICKSHIRE HOSPITAL GROUP (NO. 14). SENIOR HOUSE OFFICER (anæsthetics). Applications are invited for this appointment which is at present vacant. Duties at hospitals in the Group but mainly at the Warneford Hospital, Leamington Spa.

Applications, giving names and addresses of 3 referees, to be sent to the undersigned as soon as possible.
W. A. JAMES, Group Secretary.

87, Radford-road, Leamington Spa.

WELSH REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of SENIOR REGISTRAR in General Medicine to serve the Glantawe Hospital Management Committee. The successful candidate will be based at Morriston Hospital, Morriston, near Swansea, and may also be expected to serve other hospitals within the Group. The appointment will be for a period of 2 years in the first instance, but subject to review at the end of the first year.

Forms of application should be obtained from the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, within 14 days of appearance of this advertisement.

WELSH REGIONAL HOSPITAL BOARD. A Whole-time Locum Tenens SURGICAL REGISTRAR is required immediately at the Bridgend General Hospital. Salary will be in accordance with the terms and conditions of service of hospital medical and dental staffs.

Applications, together with the names of 2 referees, should be addressed to the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff.

WELSH REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a REGISTRAR in General Surgery to serve the Newport and East Monmouthshire Hospital Management Committee. The successful candidate will be based at the Royal Gwent Hospital, Newport, and may also be expected to serve other hospitals within the Group. The post is non-resident and will be subject to review at the end of the first year.

Forms of application should be obtained from the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, within 14 days of appearance of this advertisement.

WELSH REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a REGISTRAR in General Surgery to serve the Newport and East Monmouthshire Hospital Management Committee. The successful candidate will be based at St. Woolos Hospital, Newport, and may also be expected to serve other hospitals within the Group. The post is non-resident and will be subject to review at the end of the first year.

Forms of application should be obtained from the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, within 14 days of appearance of this advertisement.

WEST CORNWALL CLINICAL AREA. The Board of GOVERNORS OF THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited by the above Boards from registered medical practitioners for the joint appointment of REGISTRAR in Obstetrics and Gynæcology. Candidates should have had previous experience in obstetrics and gynæcology. The appointment will be held for 1 year in the first instance, and be renewable for a further year. During the first year, the successful candidate will work mainly at the Camborne-Redruth Miners' and General Hospital, Redruth, but may be required to undertake duties in other hospitals in the Area as circumstances require. The appointment, which is resident, is recognised for the M.R.C.O.G. Intending applicants and others are also invited to undertake the work on a locum basis until the permanent appointment is made.

Applications, stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 10th October, 1953.

WEST CORNWALL CLINICAL AREA. The Board of GOVERNORS OF THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited by the above Boards from registered medical practitioners for the joint appointment of SENIOR REGISTRAR in General Medicine. The appointment will be held for 1 year in the first instance but may be renewed thereafter on an annual basis. The successful candidate will be required to work for the first year mainly at the Royal Cornwall Infirmary, Truro, and to visit other hospitals in the Clinical Area as may be determined by the Regional Board from time to time. He will also be required to undertake some duties in the work of the Chest Service of the Area, and in association with the Thoracic Unit at Tehidy Chest Hospital. There are exchange arrangements with the Teaching Hospital at Bristol for Senior Registrar posts in the Region.

Applications (12 copies), stating date of birth, qualifications and experience, together with 12 copies of 2 testimonials, and the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 24th October, 1953.

WHITEHAVEN HOSPITAL, Cumberland. (109 Beds and Annexe of 19 Beds.) HOUSE SURGEON for Orthopædic and Casualty Departments (House Officer or Senior House Officer grade), vacant now.

Detailed applications, with dates and copies of 2 testimonials, to Secretary.

WHITEHAVEN HOSPITAL, Cumberland. (109 Beds and Annexe of 19 Beds.) HOUSE OFFICER (obstetrical with surgical duties), House Officer or Senior House Officer grade, vacant now.

Detailed application, with dates and copies of 2 testimonials, to Secretary.

WORCESTER. RONKSWOOD HOSPITAL. Applications are invited for the appointment of Pre-registration HOUSE SURGEON (general surgery). The post will be tenable for 6 months and salary and conditions will be in accordance with the terms for hospital medical staff.

Applications, with copies of testimonials, should be sent to the Hospital Secretary.

WORCESTER. RONKSWOOD HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER n Surgery which is now vacant. The appointment is tenable for 1 year and is subject to the terms and conditions of service for hospital medical staff.

Applications, with copies of testimonials, should be sent to the Hospital Secretary.

WORCESTER. RONKSWOOD HOSPITAL. Applications are invited for the post of RESIDENT ANÆSTHETIST which is now vacant. The post is of Senior House Officer status. The holder may expect a reasonable proportion of emergency work. Conditions in accordance with terms and conditions of service for hospital medical staff. Married quarters may be made available.

Applications, with copies of testimonials, should be sent to the Hospital Secretary.

WINDSOR. KING EDWARD VII HOSPITAL. House SURGEON in General and Orthopædic Surgery (Male or Female) required. Post recognised for F.R.C.S. and vacant 18th November; national salary. Preference given to persons seeking pre-registration House Officer post under Medical Act, 1950. Candidates to be Members of a Medical Protection Society.

Applications, stating age, nationality, qualifications with dates, with copies of recent testimonials, to Hospital Secretary by 9th October.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (311 Beds.) HOUSE OFFICER (gynæcology) required, vacant immediately. The Hospital is recognised by the Royal College.

Applications, with copies of 2 testimonials, to the Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (311 Beds.) SENIOR HOUSE OFFICER (orthopædics) required immediately. Resident. Post recognised for F.R.C.S. Wide experience available under Area orthopædic team. Appointment for 6 months in the first instance.

Applications, with copies of 2 testimonials, to the Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (311 Beds.) HOUSE PHYSICIAN to Maternity Department, vacant 26th November. Hospital is recognised by the Royal College.

Applications, with copies of 2 testimonials, to the Secretary.

YORK A AND TADCASTER HOSPITAL MANAGEMENT COMMITTEE. Required :—

City Hospital, York (modern General Hospital of 265 Beds with full consultant staff)

CASUALTY OFFICER AND ORTHOPÆDIC OFFICER (resident or non-resident) as from 14th November. Post recognised for F.R.C.S.

Grange Hospital (Geriatric Hospital of 259 Beds with Consultant staff)

JUNIOR HOSPITAL MEDICAL OFFICER in Geriatrics (resident or non-resident) as from 10th October or as soon as possible thereafter. Residence available at Doctors' Hostel of modern general hospital in same grounds.

Both posts Junior Hospital Medical Officer grade. Salary £700–£50–£1000, less £153 if resident.

Applications, giving age, nationality, experience, qualifications, and names of 2 referees, immediately to Secretary, York A and Tadcaster Hospital Management Committee, Bootham Park, York.

YORKSHIRE. EAST RIDING HOSPITAL MANAGEMENT COMMITTEE.

Westwood Hospital, Beverley, Yorks (218 Beds)

(*a*) ORTHOPÆDIC HOUSE SURGEON (Senior House Officer). Recognised for F.R.C.S. Vacant now.

(*b*) HOUSE SURGEON (first, second, or third post), vacant now. Pre-registration post. Recognised for F.R.C.S. General surgical duties, some orthopædics.

East Riding General Hospital, Driffield, Yorks (249 Beds)

(*c*) HOUSE SURGEON (first, second, or third post), vacant now. Pre-registration post. Recognised for F.R.C.S. General surgical duties, some orthopædics.

(*d*) HOUSE PHYSICIAN (first, second, or third post), vacant early October. Pre-registration post. Duties include medical and chronic wards, casualty and some anæsthetics and midwifery. Good general experience for first house appointment.

Northfield Sanatorium, Driffield, Yorks (78 Beds)

(*e*) HOUSE PHYSICIAN (first, second, or third post). General Sanatorium treatment. Provision may be made available for thoracic surgery, pathological experience, and M.M.R. Unit. Time for study.

Salary for (*a*) is £670 p.a., less £140 for board and lodging; and for (*b*), (*c*), (*d*), and (*e*) £350–£450 p.a., less £100 for board and lodging. Fully qualified practitioners may also apply for the pre-registration posts.

Detailed applications to Secretary, Westwood Hospital, Beverley, Yorkshire.

DOUGLAS. NOBLE'S ISLE OF MAN HOSPITAL. HOUSE SURGEON required. House Officer grade post, now vacant. Hospital has busy general surgical practice, including gynæcology and operative obstetrics. Duties include casualty rota duty, assistance in Outpatient and Fracture Clinics, and in the Operating Theatres, and the care of surgical inpatients. 4 residents on staff.

Applications, giving full particulars, with copies of 2 recent testimonials, to the Secretary, Noble's Hospital, Douglas, Isle of Man.

NORTHERN IRELAND HOSPITALS AUTHORITY invite applications for the whole-time post as SENIOR HOUSE OFFICER or REGISTRAR in Neurosurgery at hospitals managed by the Belfast Hospital Management Committee. The appointment may be made as Senior House Officer or Senior or Principal Registrar, the analogous grades in Great Britain being Senior House Officer, Registrar and Senior Registrar respectively. In the first instance the appointment will be for the period ending 30th September, 1954.

Applications should be made on a form, which may be obtained (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, Friends' Provident Building, 58, Howard-street, Belfast, and which must be returned so as to be received not later than 23rd October, 1953.

CHANNEL ISLANDS. JERSEY GENERAL HOSPITAL. Applications are invited for the post of CASUALTY OFFICER which will be vacant on 1st December, 1953, in the above Hospital. The appointment is for 6 months but is renewable for a further 6 months. Salary £400 p.a., less £100 for residential emoluments.

Applications to be submitted not later than 10th October, 1953, to— The President, Public Health Committee.
General Hospital, Jersey, Channel Islands.

U.S.A. SAINT VINCENT'S HOSPITAL, Bridgeport, CONNECTICUT. A.M.A. approved ROTATING INTERNSHIPS available, leading to Residencies in Specialties, in a 400-Bed general hospital, close to Metropolitan New York. In addition, it has the following features :—

(1) Regional hospital teaching affiliation with New York, University-Bellevue Medical Centre.

(2) State Department Exchange-Student Programme.

For information, write to Administrator, Saint Vincent's Hospital, Bridgeport, Connecticut, U.S.A.

Public Appointments

SOUTHERN RHODESIA GOVERNMENT. Vacancy : ASSISTANT RADIOLOGIST (Male). Salary scale £2010–£72–£2442 p.a. Appointment will be on a full-time basis and in Bulawayo in the first instance, where quarters are not provided.

Full particulars regarding conditions of service, travelling expenses, pension rights, &c., and application forms may be obtained from the Secretary, Office of the High Commissioner for Southern Rhodesia, Rhodesia House, 429, Strand, London, W.C.2. Closing date 20th October, 1953.

BIRMINGHAM. CITY OF BIRMINGHAM. Public HEALTH DEPARTMENT. Applications invited from registered medical practitioners for post of ASSISTANT ADMINISTRATIVE MEDICAL OFFICER OF HEALTH (Male or Female). Candidates should hold the Diploma of Public Health. The successful candidate will have an opportunity to gain experience in all branches of the Public Health Service, including maternity and child welfare. The salary scale is £1250–£50–£1450. Commencing salary within the scale will depend upon the Medical Officer's experience. Pension scheme (including Widows and Orphans); medical examination. The Officer appointed will be required to devote his/her whole-time to official duties and the appointment will be subject to 1 months notice on either side.

Form obtainable from Medical Officer of Health, Council House, Birmingham, 3. Applications with 3 testimonials, to be returned by 19th October, 1953.

EAST MIDLANDS GAS BOARD. Applications are invited from suitably qualified persons for the position of Whole-time MEDICAL OFFICER to the Board. The person appointed will be in charge of the Board's medical services throughout the Area and, as part of his normal duties, will be required to advise the Board on the further development of their medical services. Applicants should possess a higher professional qualification and have experience of an industrial medical service. A brief outline of the duties and scope of the post may be obtained on application to the undersigned. The commencing salary will be not less than £2000 p.a. The successful candidate may be required to pass a medical examination and, unless already subject to a pension scheme by virtue of the Gas (Pension Rights) Regulations, 1950, will be required, if eligible, to join the Board's Staff Pension Scheme within 6 months from taking up the appointment.

Applications, stating full details of age, education, qualifications and experience, together with the names of 3 referees, should be addressed to the undersigned to be received not later than Friday, 23rd October, 1953.

A. GWYNNE DAVIES, Secretary.

Beverley House, University-road, Leicester.

HER MAJESTY'S COLONIAL SERVICE. Windward ISLANDS. Doctors are required for general medical duties in the Windward Islands. Candidates will be appointed as DISTRICT MEDICAL OFFICERS in St. Vincent, but will be liable to serve in any district or institution in the Windwards if called upon to do so by the Governor. Appointments can be made on a permanent basis with pension (non-contributory) at the age of 55, or on short-term agreement (3 years). Salary scale ranges from £800 to £1000 a year. Pension is earned at the rate of 1/600th of final pensionable emoluments for each completed month of service. Private practice is permitted while the Officer is serving in a district. Income-tax at local rates. When available, Government quarters are provided at a rental of 10% of salary or 5% of the assessed value of the quarters, whichever is less. Free passages are provided in both directions for Officer and family, not exceeding 5 persons in all. Generous home leave granted after each tour. Candidates must possess medical qualifications registrable by the General Medical Council in the United Kingdom.

Application forms from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. CDE.117/39/02).

HER MAJESTY'S COLONIAL SERVICE. Nigeria. Applications are invited from Doctors with medical qualifications registrable in the United Kingdom and with at least 1 years experience after qualification for the following posts in the Medical Department of the Government of Nigeria :—

(*a*) MEDICAL OFFICERS, for general duties in preventive and curative medicine which may include purely rural health work, involving much travelling.

(*b*) MEDICAL OFFICERS OF HEALTH. Duties as under (*a*). In addition the selected Officers would undertake the control of sanitary matters, and may be required to perform the duties of Port Health Officer at a sea or air port. Candidates should possess a Diploma in Public Health. A Diploma in Tropical Hygiene, though not essential, is desirable.

Appointments may be made as follows :—

(*a*) on 3 years probation for permanent and pensionable employment in the Colonial Medical Service, with retiring age of between 45 and 55. Pensions are at the rate of 1/600th of final pensionable emoluments for each completed month of reckonable service :

(*b*) from the National Health Service. Candidates may resign from the National Health Service but retain their superannuation rights during their time in Nigeria (up to 6 years) and receive a resettlement grant of 20% of the aggregate of their Colonial salary on leaving Nigeria at the end of their engagement ; or

(*c*) on short-term contract (2–4 tours of 18 months duration) with inclusive salary of from £1087 p.a. rising to £2000 p.a. ; on completion of contract a gratuity is paid at the rate of £37 10s. for each completed period of 3 months service (including leave).

Officers appointed under (*a*) or (*c*) are required to contribute to a Widows' and Orphans' Pension Scheme. Salaries, including pensionable expatriation pay for Officers appointed under (*a*) or (*b*) range from £950 to £1850 p.a. Starting salary in all cases depends on experience and war service. Quarters are provided at low rents. Free passages in both directions are provided for Officer and his wife. Payment of the cost actually incurred on 1 outward and 1 homeward passage for each of 2 children under age of 18, subject to maximum of £75 in respect of the return journey for each child, is also granted. Income-tax at local rates. Local leave is permissible and generous home leave is granted after each tour of 18 months duration.

Application forms can be obtained from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. CDE. 117/14/01).

HER MAJESTY'S COLONIAL SERVICE. Nigeria. PATHOLOGIST required in Nigeria for routine clinical pathology and the supervision and training of African technical staff. The Officer may be required to assist in the production of yellow fever vaccine. Appointments may be made as follows:—

(*a*) on 3 years probation for permanent and pensionable employment in the Colonial Medical Service, with retiring age of between 45 and 55. Pensions are at the rate of 1/600th of final pensionable emoluments for each completed month of reckonable service ;

(*b*) from the National Health Service. Candidates may resign from the National Health Service but retain their superannuation rights during their time in Nigeria (up to 6 years) and receive a resettlement grant of 20% of the aggregate of their Colonial salary on leaving Nigeria at the end of their engagement ; or

(*c*) on short-term contract (2–4 tours of 18 months duration) with inclusive salary of from £1087 p.a., rising to £2000 p.a. ; on completion of contract a gratuity is paid at the rate of £37 10s. for each completed period of 3 months service (including leave).

Officers appointed under (*a*) or (*c*) are required to contribute to a Widows' and Orphans' Pension Scheme. Salaries, including pensionable expatriation pay for officers appointed under (*a*) or (*b*) range from £950 to £1850 p.a. Starting salary in all cases depends on experience and war service. Quarters are provided at low rents. Free passages in both directions are provided for Officer and his wife. Payment of the cost actually incurred on 1 outward and 1 homeward passage for each of 2 children under age of 18, subject to a maximum of £75 in respect of the return journey for each child, is also granted. Income-tax at local rates. Local leave is permissible and generous home leave is granted after each tour of 18 months duration. Candidates must possess a medical qualification registrable in the United Kingdom and have had at least 1 years postgraduate hospital experience. Experience in pathology is essential.

Application forms can be obtained from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. CDE.117/14/05).

HER MAJESTY'S COLONIAL SERVICE. Trinidad. 2 MEDICAL OFFICERS are required for duty in the Health Department (1 in a Mental Hospital and 1 for institutional work) in Trinidad. Appointment can be made on a permanent basis with pension (non-contributory) at the age of 55, or on short-term agreements. Candidates in the National Health Service may resign from the National Health Service but retain their superannuation rights during their time in Trinidad (up to 6 years) and receive resettlement grants of 20% of the aggregate of their Trinidad salaries on leaving Trinidad at the end of their engagements. Salary scale ranges from B.W.I. $5280 to B.W.I. $5760 (£1100–£1200) p.a. A temporary variable cost-of-living allowance is at present payable at the rate of $108 (£22 10s.) p.a. (1 B.W.I. $ equals 4s. 2d.). Starting salary is determined in accordance with the candidate's age, qualifications and experience. Pension is earned at the rate of 1/600th of the final pensionable emoluments for each completed month of service. Quarters are not provided but an allowance in lieu is paid to an Officer recruited from outside the Colony. Free passages on first appointment are provided for Officer and family not exceeding 5 persons in all, also free passages on leave subject to a maximum of 3 adult fares. Income-tax at local rates. Local leave is permissible and generous home leave is granted after each tour. Tour of service is 3 years. Educational facilities are available. Candidates for employment at the Mental Hospital should possess the Diploma in Psychological Medicine and have had at least 3 years postgraduate experience in the practice of psychological medicine, 2 of which should have been spent in working in a Mental Hospital. Candidates for institutional work should preferably possess a Diploma in Tropical Medicine and Hygiene, but must have good experience. All candidates must possess qualifications registrable in the United Kingdom. Preference will be given to candidates having higher qualifications (M.R.C.P., &c.).

Application forms can be obtained from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. CDE.117/38/05).

MIDDLESEX COUNTY COUNCIL. Senior Assistant MEDICAL OFFICER (Male) required initially in Area No. 6 (Wembley and Willesden). Whole-time, for administrative and clinical work. Must be approved by Ministry of Education for ascertainment of educationally subnormal children. May be required also to act as Medical Officer or Deputy Medical Officer of Health for 1 or both of the boroughs in the area. Diploma in Public Health or Child Health advantage. Established, subject to medical assessment and prescribed conditions. Salary as full-time Senior Assistant Medical Officer, £1150–£50–£1400 p.a. Subject to approval of Borough Council—appointed initially as Deputy Medical Officer of Health for Willesden for 20% of whole-time, in which case total salary for mixed appointment in accord with Medical Whitley Council Awards (approximately £1250 rising to £1500 p.a.).

Apply, stating age, qualifications, experience, names of 2 referees, to Joint Area Medical Officers, Area Health Office, 215, Chevening-road, Kilburn, N.W.6, by 17th October (quoting M. 520 L.). Canvassing disqualifies.

CLIFFORD RADCLIFFE, Clerk of the County Council.

Guildhall, Westminster, S.W.1.

NEWPORT. COUNTY BOROUGH OF NEWPORT. Applications for the position of ASSISTANT MEDICAL OFFICER are invited from women who are registered medical practitioners, and preferably possess a Diploma in Public Health. Salary £950–£50–£1300 p.a.

Applications, on forms to be obtained from the undersigned, to be received by 17th October, 1953. Canvassing, directly or indirectly, will disqualify.

D. E. LAWRENCE, Medical Officer of Health.

Civic Centre, Newport, Mon.

HER MAJESTY'S COLONIAL SERVICE. Mauritius. Applications are invited for the post of POLICE MEDICAL OFFICER AND SUPERINTENDENT in Charge of the Forensic Science Laboratory in Mauritius. The selected Officer would be responsible for medicolegal work arising from all serious cases of crime, the health of the police force and lectures and examinations in first-aid. Appointment will be on 3 years probation for permanent and pensionable employment. Salary scale is Rs. 10,020–Rs. 19,020 (£751 10s.–£1426 10s. p.a.). In addition, a temporary non-pensionable cost-of-living allowance is payable which amounts to 12% on salary not exceeding Rs. 12,000 (£900) p.a. and 9% on salary over Rs. 12,000 (£900) p.a. Candidates in the National Health Service may resign from the National Health Service but retain their superannuation rights (up to a limit of 6 years) during their time in Mauritius and receive a resettlement grant of 20% of the aggregate of their Mauritius salary on leaving Mauritius at the end of their engagement. Quarters are not provided, but Officers who have not been allocated Government houses will be reimbursed any difference between approved rent paid for a private house (subject to a maximum of Rs. 300 (£22 10s.) per mensem) and the 10% salary they would normally pay for a Government house. For this purpose, Officers living in hotels or boarding houses will be regarded as paying half the board and lodging charge for themselves and their wives in respect of rent. Income-tax at local rates. Free passages in both directions are provided for Officer, wife, and children not exceeding 5 persons in all. Generous home leave is granted after each tour of 3 years. Candidates must have medical qualifications registrable by the General Medical Council in the United Kingdom and possess 1 or more years postgraduate experience. Further training may be given if necessary to the selected candidate before he leaves for Mauritius.

Application forms may be obtained from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. 27215/360).

HER MAJESTY'S COLONIAL SERVICE. Falkland ISLANDS. 2 MEDICAL OFFICERS are required for the Falkland Islands, 1 of whom will be stationed at Darwin, and the other is likely to spend part of his engagement at Stanley, where there is a general hospital, and the remainder in the country. Riding is essential for the Officer stationed outside Stanley and can readily be learned in the colony. The climate is temperate and very suitable for young children. These appointments offer an excellent life for young country-minded couples. Appointments can be on a permanent basis with pension (non-contributory) at the age of 55, or on short-term agreement for 3 years in the first instance. Salary scale ranges from £720 p.a. to £960 p.a. A temporary (non-pensionable) cost-of-living allowance of £107 5s. p.a. is also payable. Quarters are provided at a rental of 5% of salary. Free passages on appointment and on leave are provided for Officer and family up to the cost of 3½ full fares. Income-tax at local rates (1s. in the £ on first £100 ; 2s. on next £250 ; 2s. 6d. on next £250 ; 3s. on next £250 ; 3s. 6d. thereafter). Generous home leave is granted after each tour of 3 years. Candidates must possess medical qualifications registrable in the United Kingdom.

Application forms can be obtained from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. CDE. 117/50/02).

MONMOUTHSHIRE COUNTY COUNCIL. The Council invite applications from duly qualified medical practitioners for the appointments of ASSISTANT MEDICAL OFFICERS. Possession of the D.P.H., D.C.H., D.Obst.R.C.O.G., or similar qualifications would be an advantage. The salary will be at the rate of £950 p.a. rising by increments of £50 to a maximum of £1300 p.a. The successful candidates will be required to act under the direct supervision of the County Medical Officer, to devote whole time to the work of the County Council, and to reside in such place as the County Council may determine. The posts will be subject to the provision of the National Health Service Superannuation Regulations, and to a satisfactory medical examination.

A schedule of duties to be performed, together with conditions of appointment and a form of application can be obtained from the County Medical Officer, to whom applications accompanied by copies of not more than 3 testimonials, are to be sent by 31st October, 1953. VERNON LAWRENCE,
County Hall, Newport, Mon. Clerk of the Council.

TREASURY MEDICAL SERVICE. Applications are invited from medical practitioners, practising in the districts detailed below, for appointment in a part-time and mainly advisory capacity as LOCAL TREASURY MEDICAL OFFICER for each of the places or groups of places shown. The town shown in parentheses after the place-name indicates the Head Post Office Area in which the place, or group of places, is situated. Successful applicants will be required to examine and report on the condition of certain Government Officers, teachers, candidates for appointment, &c., who may be referred to them from time to time ; and to attend when summoned to an emergency case of accident or sudden illness occurring in a Government office in the neighbourhood. Fees for this work, and mileage allowance where necessary, will be paid on a scale agreed with the British Medical Association.

Intending applicants should write, within 14 days, to Treasury Medical Adviser, Treasury Chambers, Whitehall, S.W.1, for a form on which application may be made. Applicants should be not more than 60 years of age.

The places for which applications are invited are as follows :—

ENGLAND AND WALES

Holt (Fakenham, Norfolk).
Leeds (Middleton) 10 (Leeds).
Penmaenmawr (Llandudno).
Buckfastleigh (Totnes).
Oakengates and Shifnall (Wellington, Shropshire).

INVERNESS COUNTY COUNCIL. Applications are invited from registered medical practitioners preferably holding the D.P.H. or similar qualification, for the appointment of ASSISTANT MEDICAL OFFICER. The candidate appointed will participate in all the work of the Department as directed by the Medical Officer of Health. Experience in School Health Service and tuberculosis will be an advantage. Salary £950 p.a.–£50–£1300 p.a. with travelling and subsistence allowances at the rates payable by the County Council. The post is superannuable.

Applications, accompanied by copies of 3 testimonials, should be lodged with the undersigned within 14 days of the appearance of this advertisement. R. WALLACE, County Clerk.
County Buildings, Inverness.

General Practice

For an Executive Council post (England and Wales) apply on form E.C.16A obtainable from the council. Mark envelope "Vacancy."

WORKINGTON. Applications are invited for Vacancy from doctors wishing to undertake general medical services. The district which needs to be served is combined urban and rural. Living and surgery accommodation, together with equipment, available. Approximate number of persons on list of retiring doctor is 3100.

Applications, in writing, on Form E.C.16A (obtainable from the address given below), should be sent to the undersigned, together with details of professional experience, age, and any other particulars including any references it is desired to submit, not later than 15th October, 1953.

F. M. SMITH,
Clerk to the Cumberland Executive Council.
7, Chatsworth-square, Carlisle, 24th September, 1953.

Hospital Services : Non-Medical Appointments

WOLVERHAMPTON HOSPITAL MANAGEMENT COM-MITTEE GROUP NO. 16 BIRMINGHAM REGION. THE ROYAL HOSPITAL, WOLVERHAMPTON. (An Associated Hospital of the University of Birmingham Medical School.) PATHOLOGICAL LABORATORIES. BIOCHEMIST required to take charge of Department. Terms of employment and salary in accordance with Whitley scale.

Applications, with full details of qualifications and experience to the Secretary.

Miscellaneous

To non-professional posts the Notification of Vacancies Order 1952 applies

Temporary Medical Officer required for exploration party in Middle East. Most of work will be on air-conditioned ship. Should have experience in emergency surgery and knowledge of Arabic an advantage. Contract will be for 2 years with probable extension and possibility of permanent appointment. Bachelor preferred, but shore accommodation will eventually become available for married man. Emoluments including allowances, £2250–£2500 p.a.—Write giving full particulars to Staff Department R/F, SHELL PETROLEUM COMPANY LIMITED, St. Helen's-court, London, E.C.3.

Manufacturing Chemists near London require the services of a man qualified in both medicine and pharmacy. The duties will be chiefly of an administrative nature, and the salary will not be less than £1500 p.a.—Apply initially in writing stating age, qualifications and experience to : Address, No. M.D. 857, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

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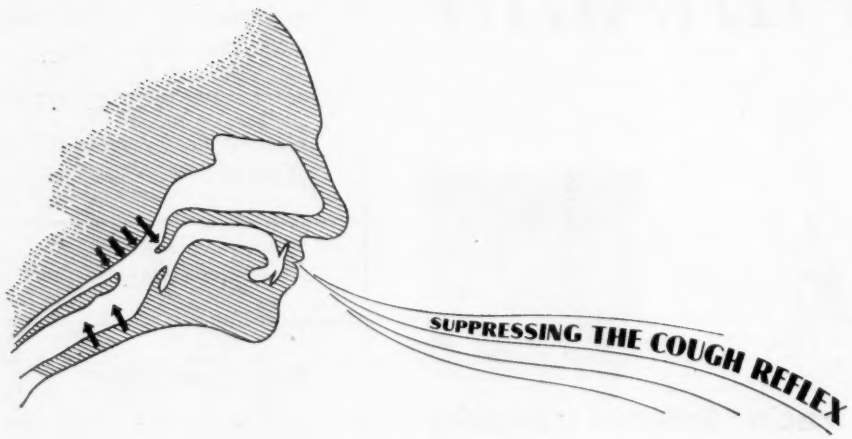

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